



DEA REF: 14/12/16/3/3/3/51

NEAS REF: DEA/EIA/0001413/2012

**APPLICATION FOR INTEGRATED  
ENVIRONMENTAL AUTHORISATION AND  
WASTE MANAGEMENT LICENCE IN TERMS  
OF THE:**

**NATIONAL ENVIRONMENTAL  
MANAGEMENT ACT, 1998 (ACT 107 OF  
1998) AS AMENDED AND THE  
ENVIRONMENTAL IMPACT ASSESSMENT  
REGULATIONS 2010; AND**

**NATIONAL ENVIRONMENTAL  
MANAGEMENT: WASTE ACT, 2008 (ACT 59  
OF 2008) AND GOVERNMENT NOTICE 718  
OF 2009**

## **DRAFT SCOPING REPORT**

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**Title:** Integrated Waste Management Licence Application for the Kusile Coal Fired Power Station: Draft Scoping Report

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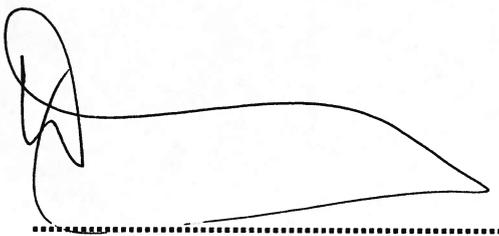
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**Approved for Sebata Institute by:**



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**Date:** 2013 | 04 | 13 .....

# INTEGRATED WASTE MANAGEMENT LICENCE APPLICATION FOR THE KUSILE COAL FIRED POWER STATION

## DRAFT SCOPING REPORT

(Ref. No. 14/12/16/3/3/3/51)

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## **LIST OF ABBREVIATION**

ADDD	Ash Dump Dirty Water Dam
BID	Background Information Document
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAD	Emergency Ash Dump
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 (Act of 73 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
IDP	Integrated Development Plan
FGD	Flue Gas Desulphurisation
ISP	Internal Strategic Perspective
GN	Government Notice
HDPE	High Density Polyethylene
I&APs	Interested and Affected Parties
IAIA	International Association for Impact Assessment
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NWA	National Water Act, 1998 (Act 36 of 1998)
NPV	Net Present Value
PPP	Public Participation Process
RN	Registration Number
SDD	Station Dirty Water Dam
SDD ST	Station Dirty Water Dam Settling Tank
UNFCCC	United Nations Framework Convention on Climate Change
WML	Waste Management Licence
WMLA	Waste Management Licence Application
WULA	Water Use Licence Application

## LIST OF UNITS

ha	hectares
km	kilometres
MW	Megawatts
ℓ/s	litres per second
m	metres
mamsl	metres above mean sea level
mm	millimetres
m <sup>3</sup>	cubic metres
%	percentage
m <sup>3</sup> /a	cubic metres per annum
mm/a	millimetres per annum

## 1. INTRODUCTION

### 1.1 BACKGROUND

In 2006 Eskom Holdings initiated an Environmental Impact Assessment (EIA), undertaken by Ninham Shand (Pty) Ltd, for the construction of a 4 800 MW Kusile Coal-Fired Power Station and associated infrastructure in the Witbank area. The power station covers approximately 2 500 ha of land on the Farm Hartebeesfontein 537 JR and the Farm Klipfontein 566 JR. The power station precinct includes the power station building, administration buildings (administrative, medical, maintenance, services) and the high voltage yard. The associated infrastructure applied for during the EIA included a water treatment works, a wastewater treatment works, access roads, railway line, water supply pipelines, a coal stockyard, an ash disposal facility, a coal and ash conveyor system and water storage facilities.

Ninham Shand concluded that the proposed development would not conflict with the principles of the Environmental Conservation Act (ECA), 1989 (Act No. 73 of 1989), that the Public Participation Process (PPP) was undertaken as per relevant regulations and the issues of the Interested and Affected Parties (I&APs) were adequately addressed. Ninham Shand therefore recommended that the proposed development should be authorised subject to the implementation and enforcement of the recommendations and mitigation measures contained in the EIA Report and Environmental Management Plan (EMP) (Please refer to **Appendix A** and **B** for copies of the EIA Report and the EMP respectively).

In June 2007, the Department of Environmental Affairs (DEA) issued a positive Environmental Authorisation (EA) (Ref: 12/12/20/807) for the construction of the Kusile Coal Fired Power Station and Associated Infrastructure in the Witbank Area, Mpumalanga Province (Please refer to **Appendix C** for a copy of the EA). This June 2007 EA was appealed and a revised EA was issued in March 2008 under the ECA.

In terms of this EA, Eskom can construct the power station and operate ash disposal systems. The EA also states that Kusile Power Station will have Flue Gas Desulphurisation (FGD) technology to minimize particulate and SO<sub>2</sub> emissions. As a result of FGD technology, gypsum shall be produced as a by-product during operation of the power station.

At the time of the EIA, Eskom's intention was to dispose of ash only at the ash disposal facility and initiated an investigation to determine existing potential

opportunities in the market which would result in the use of gypsum. Although the possibility of gypsum being generated through the FGD process and the commercial value related to it was discussed in the final EIA Report, the disposal of gypsum on the ash dump was not included. The co-disposal of gypsum with ash is therefore not authorised.

Since gypsum is considered to be a hazardous waste (classified as a medium hazardous waste), a Waste Management Licence (WML) must be applied for to co-dispose ash and gypsum as a listed activity 9, Category B of GN718 and the construction of the facility (Ash/gypsum dump, the Ash Dump Dirty Water Dam (ADDD), the Station Dirty Water Dam (SDD) and the station dirty dam settling tanks (SDD ST)) will trigger activity 11, Category B of GN 718.

In addition to the hazardous waste that will be disposed of at Kusile, general waste including rock spoils (the concrete rock spoil and K3 spoils) produced during construction will also be temporarily stored on site.

The construction of the ADDD within a wetland will trigger activities 11 and 18 of GN R544. **Table 1-1** and **Table 1-2** give a summary of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEMWA) activities that will be triggered as a result of the various waste activities at Kusile.

**Table 1-1: Summary of NEMA Listed Activities being applied for**

<b>Number and date of the relevant notice:</b>	<b>Activity No (s) (in terms of the relevant or notice) :</b>	<b>Description of each listed activity as per the detailed project description (and not as per wording of the relevant Government Notice):</b>
Government Gazette R544 2 August 2010	<b>11</b>	The construction of the Ash Dump Dirty Water Dam (ADDD) and settling dams within a wetland.
	<b>18</b>	Removing soil located in a wetland for the construction of a waste management facility and depositing ash/gypsum waste material exceeding 5 m <sup>3</sup> into the wetland for storage purposes using a waste management facility.

**Table 1-2: Summary of NEMWA Listed Activities being applied for**

<b>No. &amp; Date Of The Relevant Notice:</b>	<b>Activity Numbers (As Listed In The Waste Management Activity List) :</b>	<b>Description of Listed Activity</b>
Government Notice 718 of 3 July 2009	<b>Category A 3 (1)</b>	The temporary storage of silty soils and degradable rock which is not suitable for use as general backfill within the project (classified as general waste) at the K 3 spoil stockpile that has the capacity to store in excess of 100 m <sup>3</sup> .
		The temporary storage of construction waste (mainly concrete, unusable soil, rebar and unwanted material, classified as general waste) at the Concrete spoil stockpile that has the capacity to store in excess of 100 m <sup>3</sup> .
Government Notice 718 of 3 July 2009	<b>Category B (9)</b>	The co-disposal and storage of ash and gypsum which has been classified as a moderate hazardous waste to land.
		The disposal of the belt filter press sludge (gypsum) from the FDG process to land.
	<b>Category B (11)</b>	The construction of a hazardous waste facility (Ash/Gypsum Dump) and its associated dams (Ash Dump Dirty Water Dam, Station Dirty Water Dam and Station Dirty Water Dam Settling Tank).

The March 2008 Environmental Authorisation granted Kusile Power Station permission to construct a number of waste related facilities (**DEA Ref: 12/12/20/807**). In May 2010, Kusile Power Station was also granted a waste management licence (**DEA Ref: 12/9/11/L193/6**) (**Appendix D**) for additional waste activities. The authorised waste activities are summarised in **Table 1-3**.

**Table 1-3: Summary of Authorised Waste Activities at Kusile**

No.	Activity	Comments
1.	Sewage treatment works	The Sewage Treatment Works were authorised in terms of the 2008 Environmental Authorisation ( <b>DEA Ref: 12/12/20/807</b> ).
2.	Coal Stockyard Pollution Control Dam (PCD)	The Coal Stockyard PCD was authorised in terms of the 2008 Environmental Authorisation ( <b>DEA Ref: 12/12/20/807</b> ).
3.	Potable Raw Water Treatment (Brine)	The Potable Raw Water Treatment (brine) was authorised in terms of the 2008 Environmental Authorisation, which authorised water and waste water treatment facilities ( <b>DEA Ref: 12/12/20/807</b> ).
4.	Water Treatment Plant	The Water Treatment Plant was authorised in terms of the 2008 Environmental Authorisation, which authorised water and waste water treatment facilities ( <b>DEA Ref: 12/12/20/807</b> ).
5.	Effluent Neutralisation Plant	The Effluent Neutralisation Plant was authorised in terms of the 2008 Environmental Authorisation, which authorised water and waste water treatment facilities ( <b>DEA Ref: 12/12/20/807</b> ).
6.	Holding Recycling Dams and De-gritting Sumps	The Holding Recycling Dams and De-gritting Sumps were authorised in terms of the 2008 Environmental Authorisation, which authorised water and waste water treatment facilities ( <b>DEA Ref: 12/12/20/807</b> ).
7.	Temporary Demineralisation Plant	The Temporary Demineralisation Plant was authorised in terms of the 2008 Environmental Authorisation, which authorised water and waste water treatment facilities ( <b>DEA Ref: 12/12/20/807</b> ).
8.	Radial Stacker	The Radial Stacker was authorised in terms of the 2008 Environmental Authorisation,

No.	Activity	Comments
		which authorised ash disposal facility ( <b>DEA Ref: 12/12/20/807</b> ).
9.	Emergency Ash Dump (EAD)	The EAD was authorised in terms of the 2008 Environmental Authorisation, which authorised ash disposal facility ( <b>DEA Ref: 12/12/20/807</b> ).
10.	Hazardous Waste during construction	The hazardous waste produced during construction was authorised in terms of the waste licence ( <b>DEA Ref: 12/9/11/L193/6</b> ).
11.	General Waste during construction	General waste produced during construction was authorised in terms of the waste licence ( <b>DEA Ref: 12/9/11/L193/6</b> ).

In addition to the activities in **Table 1-1** and **Table 1-2**, Eskom is also looking to consolidate all waste activities into one licence and is requesting that the Department includes the abovementioned activities (**Table 1-3**), which were applied for and authorised prior to the promulgation of the NEMWA, in the Licence.

## 1.2 PURPOSE OF THIS STUDY

The disposal of hazardous waste is listed in GN718 and therefore requires a WML. The objectives of this study are to:

- ensure that the environmental effects are taken into account in the planning and implementation of the planned project;
- promote sustainable development;
- ensure that activities do not have a detrimental effect on the environment;
- facilitate public involvement; and
- provide the information required to enable the Minister to make informed decisions regarding the authorisation of the project.

## 1.3 THE OBJECTIVES OF THIS REPORT

The scope of an environmental assessment is defined by the range of issues and alternatives to be considered, and the approach towards the assessment that will follow (DEA, 2002). Scoping identifies the most important issues that must be covered in the EIA (Aucamp, 2009), which is the purpose of this report, and

eliminates those that are of little or no concern. The objectives of this report are to ensure:-

- that the EIA studies remain focused on the significant effects;
- that time and money are not wasted on unnecessary studies;
- a fair interaction between and/or among all stakeholders to identify the key issues for investigation;
- that alternatives for achieving the objectives of the proposed activity are given due consideration;
- that specialists have been appointed to execute the work required, and provided with adequate terms of reference that are acceptable to all stakeholders; and
- that the roles and responsibilities of various stakeholders in the process have been clarified, and all participants have agreed on the process to be followed.

Scoping has been undertaken in compliance with the EIA Regulations No R. 543 of 2010, as presented in **Table 1-4**.

**Table 1-4: Requirements of EIA Regulations No. R 543 (2010)**

<b>Regulation 26</b>	<b>Compliance</b>
a) Completion of the application form for environmental authorisation of the relevant activity.	Integrated Waste Licence Application Form submitted to DEA on 23 July 2012 and resubmitted on 17 August 2012. An amended application was submitted to the DEA on 28 February 2013.
b) (i) a declaration of interest by the EAP on a form provided by the competent authority;	
<b>Regulation 27</b>	<b>Compliance</b>
a) Public participation process set out in Regulation 56.	Chapter 8
b) Give notice, in writing, of the proposed application to any organ of state which has jurisdiction in respect of any aspect of the activity.	
c) Open and maintain a register of all interested and affected parties in respect of the application in accordance with Regulation 57.	
d) Consider all objections and representations	

received from interested and affected parties following the public participation process.	
e) Subject the application to scoping by identifying -	Chapter 9
(i) issues that will be relevant for consideration of the application	
(ii) the potential environmental impacts of the proposed activity	
(iii) alternatives to the proposed activity that are feasible and reasonable	Chapter 5
f) Prepare a scoping report in accordance with Regulation 29.	This report
g) Give all registered interested and affected parties an opportunity to comment on the scoping report in accordance with Regulation 58.	Chapter 8
<b>Regulation 28</b>	<b>Compliance</b>
1) (a) Details of -	
(i) the EAP who prepared the report	Chapter 1
(ii) the expertise of the EAP to carry out scoping procedures	Chapter 1
b) A description of the proposed activity and of any feasible and reasonable alternatives that have been identified.	Chapters 3, 4 and 5
c) A description of the property on which the activity is to be undertaken and the location of the activity on the property.	Chapter 2
d) A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	Chapter 7
e) An identification of all legislation and guidelines that have been considered in	Chapter 6

the preparation of the scoping report.	
f) A description of environmental issues and potential impacts, including cumulative impacts that have been identified.	Chapter 9
g) Information on the methodology that will be adopted in assessing the potential impacts that have been identified, including any specialist studies or specialised processes that will be undertaken.	Chapter 10
h) Details of the public participation process conducted in terms of Regulation 28(a), including –	Chapter 8
(i) the steps that were taken to notify potentially interested and affected parties of the application	
(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given	
(iii) a list of all persons or organisations that were identified and registered in terms of Regulation 57 as interested and affected parties in relation to the application	
(iv) a summary of the issues raised by interested and affected parties, and the date of receipt of and the response of the EAP to those issues	
i) A plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include –	Chapter 10

(i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken	
(ii) an indication of the stages at which the competent authority will be consulted	
(iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity	
(iv) particulars of the public participation process that will be conducted during the environmental impact assessment process	
2) Any guidelines applicable to the kind of activity which is the subject of the application.	Chapter 6

**1.4 APPLICANT**

The applicant **Eskom Holdings SOC-Kusile Power Station** is represented by:

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## 1.5 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Eskom appointed Sebata Institute to conduct the WMLA. The environmental assessments will be undertaken by Deon Esterhuizen, with assistance from Ndomupei Dhemba.

**Deon Esterhuizen** is a certified Professional Natural Scientist (RN: 400154/09) with a MSc in Environmental Management with 20 years of experience in water related projects, which include water quality management, registration and licencing of water users, completion of Environmental Impact Assessments in support of the issuing of Record of Decisions, development of a management guide for domestic water use, project management, and implementation of the Resource Directed Measures as required by the Department of Water Affairs.

**Ndomupei Dhemba** is a GIS and Remote Sensing specialist with a Masters degree in GIS and remote sensing for environmental management. She has six years of experience in natural resources management including resource inventorying and auditing, biodiversity assessment and spatial planning, GIS and remote sensing, as well as environmental management. Ndomupei has also undertaken environmental assessments for projects in Tanzania, Botswana and South Africa. She also assisted with the applications for amendments to authorisation on the Gautrain.

The contact details of the EAP are as follows;

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## 1.6 STRUCTURE OF THIS REPORT

The project locality is presented in **Chapter 2**. A full project description is provided in **Chapter 3** and **Chapter 4**. Alternatives to be considered during the EIA phase are given in **Chapter 5**. The legislation that was considered in preparation of this Scoping

Report is listed in **Chapter 6**. A description of the receiving environment is presented in **Chapter 7**. The details of the public participation process (PPP) are given in **Chapter 8**. **Chapter 9** contains a summary of issues identified.

**Chapter 10** contains a Plan of Study for EIA, which entails the authority consultation, impact assessment methodology, PPP, and terms of reference for specialist studies.

**Chapter 11** provides the conclusion and recommendations for the EIA phase.

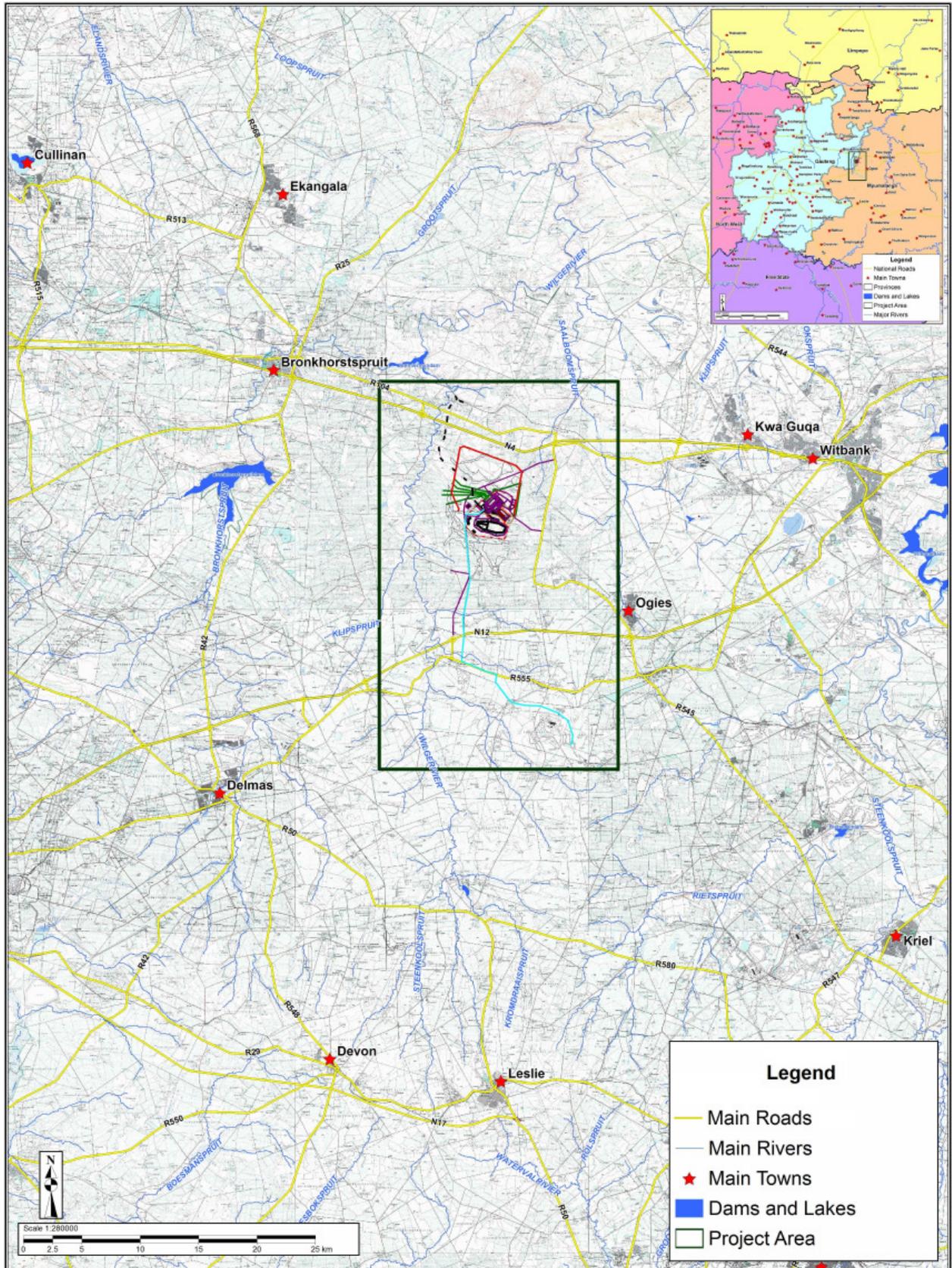
Referenced material is presented in **Chapter 12**.

## 2. LOCATION OF PROJECT

The Kusile Project is located on approximately 2 500 ha on the farms of Hartbeestfontein 537 JR and Klipfontein 566 JR within the Mpumalanga Province.

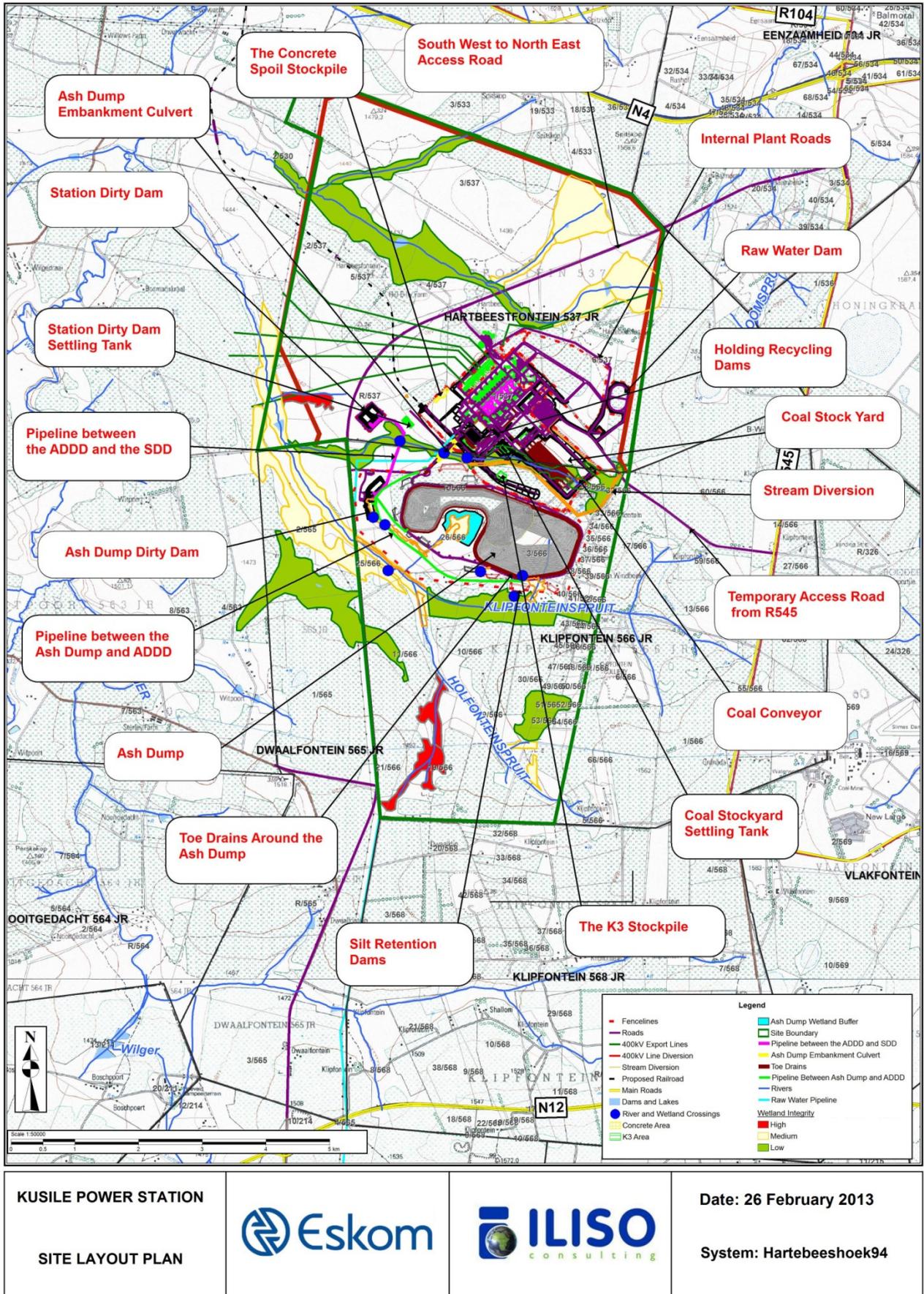
The Kusile Project falls within the jurisdiction of the Delmas Local Municipality which is in the Mpumalanga Province. The largest town within a 30 km radius of the Kusile Project site is Emalahleni. The smaller town of Kungwini lays approximately 20 km north-west of the site.

**Figure 2-1** shows the Kusile Project location. **Figure 2-2** and **Figure 2-3** show the current Project Layout Plan



<b>KUSILE PROJECT</b> Locality Map	 Eskom	 ILISO CONSULTING	FIGURE 2-1 Date: 15 November 2010 System: Hartebeeshoek94
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**Figure 2-1: Kusile Project Location**



KUSILE POWER STATION  
SITE LAYOUT PLAN



Date: 26 February 2013  
System: Hartebeeshoek94

Figure 2-2: Kusile Site Layout Plan

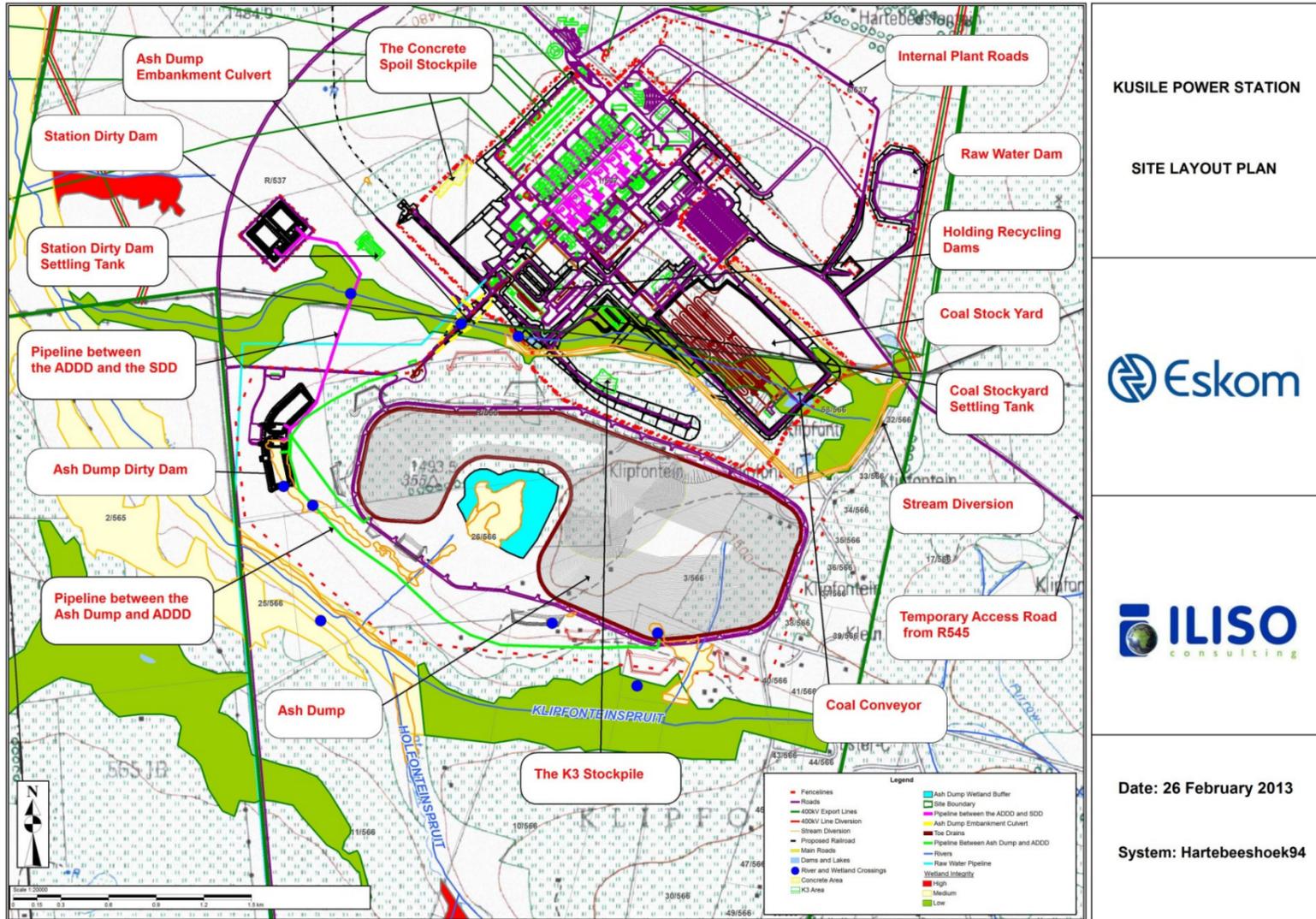


Figure 2-3: Kusile Site Layout Plan

### 3. PROJECT DESCRIPTION

The Kusile Project entails the construction of the following:

Power Station Precinct:

- i) Power station buildings
- ii) Administration buildings (control buildings, medical, security, etc);
- iii) High voltage yard

Associated Infrastructure:

- i) Coal stock yard
- ii) Coal and ash conveyors
- iii) Water supply pipelines (temporary and permanent)
- iv) Water and waste water treatment facilities
- v) Ash disposal system
- vi) Access roads (including haul roads)
- vii) Dams for water storage
- viii) Railway siding and/or line for sorbent supply

This integrated waste management licence application is applicable to the following:

- The ash/gypsum disposal facility and the AD DD;
- The SDD and the SDD ST; and
- Concrete and K3 Stockpile Areas.

All the design Reports are attached in **Appendix E**.

#### 3.1 ASH DISPOSAL PROCESS

Above ground ash disposal will be used. The ash produced through the combustion of the coal will be removed from the bottom of the boiler (boiler bottom ash) and the fly ash removed from the top of the boiler together with the flue gas (via electrostatic precipitators or bag filters) and sent to an ash/gypsum dump.

The Flue Gas Desulphurisation (FGD) process that will be used to reduce sulphur emissions will also result in filter cake/gypsum which will be transported via a conveyor belt to the ash/gypsum disposal facility.

### **3.2 ASH/GYPSUM DISPOSAL FACILITY**

The ash/gypsum disposal facility will be located to the south of the power station, on high ground between two drainage paths. Construction of the facility will entail:

- Excavate and construct the dirty water concrete channels in 1 000 m lengths at a time.
- Backfill trenches after completion of each section.
- Construct perimeter road bed and balance of culvert crossings over 1 000 m lengths at a time.
- Excavate and form clean water drains in 1 000 m sections together with culverts and culvert discharge trenches to silt retention dams.
- Topsoil removal and foundation preparation in 0.25 km squared sections of the phase one footprint to receive the liner sandwich installation (also installed in 0.25 km squared sections).
- Deliver, spread and tip the 300 mm G5 protection layer over the installed liner as soon as each 0.25 km squared section is complete.
- Form toe wall to each liner panel section, including drainage pipes at 75 m intervals for storm water discharge to the silt retention dams.

The disposal of ash/ gypsum is to be undertaken as follows:

Place the ash/gypsum onto the ash/gypsum disposal facility for the first 4 years of power station operation by a load and haul operation. The ash and gypsum will be delivered by conveyer to a radial stacker near the ash/gypsum disposal facility, for subsequent loading, hauling and placement into paddocks of approximate size 200 m by 200 m, developed in 2 m lifts, spread initially over the ash/gypsum disposal facility 5-year half-footprint, to full design height on the ash/gypsum disposal facility, and then similarly over the second half of the footprint.

### **3.3 ASH/GYPSUM DUMP DEPOSITION MODELLING**

The power station comprises six boiler units which will be commissioned one every eight months, starting December 2014. The full power station ash/gypsum output will thus only be effective in the 4<sup>th</sup> year of operation. In years 6 to 60 of operation, only gypsum will be placed at significantly reduced tonnages onto the ash/gypsum disposal facility by the same, but smaller, load and haul operation.

### **3.4 ASH/GYPSUM DISPOSAL FACILITY FLOOD HYDROLOGY**

The ash/gypsum load and haul deposition system will enable the disposal facility operators to place the ash/gypsum disposal facility in such a manner as to be free

draining in shape, with minimisation of any depression that will collect and retain stormwater run-off.

Temporary artificial channels will be constructed on the exposed ash surfaces to lead stormwater down the faces to the dirty water collection channels in a controlled manner thereby preventing erosion. Irrigation of the exposed ash surfaces will take place to achieve dust control. Irrigation water volumes will be restricted as far as possible to limit any seepage potential arising from the irrigation waters.

### **3.5 ASH/GYPSUM DISPOSAL FACILITY STABILITY**

Exposed ash surfaces will be finally shaped at 1:5 on the side slopes and at 1:200 on the top surfaces and rehabilitated as soon as practically possible by placement of selected topsoil and vegetation cover. These areas will be irrigated to promote and sustain the vegetation.

### **3.6 ASH DUMP DIRTY WATER DAM**

The dirty water collection channels will be routed to the ADDD, which is located northwest of the disposal facility. The liners for the ADDD will be designed in accordance with the Department of Water Affairs (DWA) document "Minimum Requirements for Waste Disposal by Landfill (1998)" and will be subject to DWA approval. The ADDD will also have concrete lined sections at the low end of the ADDD for equipment access and removal of accumulated solids. The water stored in the ADDD will be used for dust suppression. In case of excessive stormwater in the ADDD, manual controls will allow gravity flow to the station dirty dam contingent on water quality. The outlet pipe in the ADDD will be elevated above operation volume levels to minimize the conveyance of solids to the SDD. Note that a 50 year, 8 day storm event can be stored in the ADDD for the worst case dirty area of the ash/gypsum disposal facility and that the ADDD is comprised of two 50 % cells so that one cell can remain in service while the other cell is being maintained.

### **3.7 RADIAL STACKER**

The Radial Stacker will be located adjacent to the 10-year ash/gypsum dump. Ash and gypsum will be delivered by conveyor to a radial stacker near the ash/gypsum disposal facility, for subsequent loading, hauling and placement into paddocks of approximated size 200 m by 200 m, developed in 2 m lifts. The ash and gypsum will be spread initially over the ash/gypsum disposal facility 5-year half-footprint, to full

design height on the ash/gypsum disposal facility, and then similarly over the second half of the footprint.

For the radial stacker operation, the combined waste product from the overland conveyors will be stacked in a kidney shaped pile by a radial stacker machine adjacent to the ash/gypsum disposal facility. The kidney shaped pile will be reclaimed by mobile equipment and loaded into trucks which will drive into the ash/gypsum disposal facility and dump the waste product. The radial stacker area will be large enough to accommodate the pile from the radial stacker and to also accommodate multiple trucks and mobile equipment working on the pile simultaneously. The radial stacker area will have a concrete slab with a liner under it and will be fed by one of the overland link ash conveyors. The other overland link ash conveyor will discharge directly onto a concrete slab, also lined, and create a conical shaped pile just North of the radial stacker. This conical shaped pile will be much smaller than the kidney shaped pile but will be used if the conveyor to the radial stacker is disabled or separation of the ash and FGD dewatered solids is required. The liners for the radial stacker will also be designed in accordance with the DWA Minimum Requirements for Waste Disposal by Landfill (1998)", and will be subject to DWA approval.

Should there be a problem with the radial stacker or the 10-year ash/gypsum disposal facility, the handling system will convey the waste products to an emergency ash/gypsum disposal facility (EAD) area.

### **3.8 EMERGENCY ASH DUMP (EAD) AREA**

The Emergency Ash Dump (EAD) will consist of a concrete lined area of approximately 1.4 ha, sloped to fall with a concrete trapezoidal drain on two adjacent sides and a concrete rectangular channel drain on the other two sides that joins the trapezoidal drain. The EAD will be used occasionally for the temporary storage of quenched ash for periods of up to 24 hours, before being removed for permanent disposal on the appropriately licensed waste disposal facility. The EAD therefore does not represent the same level of environmental risk as the permanent ash disposal facility.

The purpose of the EAD is to have a place to stack waste product should both the overland link ash conveyors become disabled. The EAD is sized to provide 24 hours storage of bottom ash and FGD dewatered solids for all 6 units running at full

capacity. The fly ash will be stored in the fly ash silos for up to 24 hours in case of an emergency. The EAD will have a large concrete slab on which the pile will be stacked. Underneath the concrete will be a liner which will be designed in accordance with the DWA Minimum Requirements for Waste Disposal by Landfill, and will be subject to DWA approval. The concrete slab is designed to contain and drain the EAD area and direct run off to a sump located on the North West corner of the slab. After an emergency and once the overland link ash conveyors are operational again the bottom ash will be reclaimed and loaded onto the overland link ash conveyors and taken to the ash/gypsum disposal facility.

### **3.9 STATION DIRTY DAM**

All potentially contaminated water on the Kusile Power Station will be managed in a closed system. The SDD are two equal capacity, lined, temporary holding dams that act as a collection point for all polluted storm-water and wash-down water on the Kusile site, before it is pumped to the Holding/Recycle Dams (HRD).

The SDD will receive inflows from two distinct sources:

- 1) Coal Stockyard Settling Tanks (CSY ST): The CSY ST will receive inflows from the Coal Stockyard (CSY), EAD, limestone processing area, and a number of grit sumps. Clarified water leaving the CSY ST will travel via gravity pipeline to the SDD.
- 2) Station Dirty Dams Settling Tanks (SDD ST): The SDD ST will receive inflows from the station terrace area. Clarified water leaving the SDD ST will travel via gravity pipeline to the SDD.

The SDD will receive gravity discharges of dirty water from the rest of the Kusile Power Station. It will be the furthest downstream dirty water structure on the site and therefore is required to be down-gradient from the power station. The natural contours of the site slope downwards to the north-west, towards the non-perennial tributary of the Klipfonteinspruit. The SDD will be optimally located approximately 1 km north-west of the power station's north-west fence corner. The selected position avoids surrounding wetlands and the 1:100 year flood line of the natural stream. The SDD elevation will range from 1 441 meters above sea level (masl) at the sump of Compartment No. 2 to 1 454 masl at the crest of Compartment No. 1.

To prevent contamination to the underlying soil, the SDD is required to be a fully contained structure. The liners for the SDD will be designed in accordance with the

DWA Minimum Requirements for Waste Disposal by Landfill (1998)", and will be subject to DWA approval.

### **3.10 STATION DIRTY DAM SETTLING TANK**

The SDD ST will be located to the north-west of the main power block, and south-east of the SDD. This position is down-gradient of the power station terrace and in close proximity to the SDD. The SDD ST will receive gravity discharges of dirty water from the power station terrace. The two compartments of the settling tank will be partially excavated into the natural ground and partially built in a fill terrace. The terrace elevation was carefully planned in conjunction with the inlet and outlet pipe hydraulic requirements.

The SDD ST will consist of two equal capacity concrete basins that clarify contaminated water from the power station terrace before it travels by gravity pipeline to the SDD. The SDD ST will transmit dirty water inflows from the main power station terrace via a pipeline, to the SDD.

The SDD ST is designed:

- To pass all of the dirty water runoff from its inflow sources for the 1:50 year, peak instantaneous storm event.
- With an emergency spillway to accommodate larger events.
- With two equal capacity compartments which can each pass 6.55 m<sup>3</sup> /s. The water enters each compartment of the SDD ST via four sluice gates (1.75 m<sup>2</sup>). The two compartments will allow for occasional maintenance and inspection access (preferably during the dry season) without interrupting the functionality of the SDD ST under normal circumstances.

### **3.11 FLUE GAS DESULPHURISATION WASTEWATER TREATMENT PLANT**

The FGD process will result in the production of an FGD wastewater/brine stream which has significantly high concentrations of chlorides, magnesium, calcium, and heavy metals. This wastewater cannot be directly re-used elsewhere in the station. As Kusile Power Station is to be a zero-liquid effluent discharge site, this wastewater will require specialised treatment. Kusile Power Station will employ a three step process of 1) Pre-treatment, 2) Evaporation/Concentration, and 3) Crystallisation to treat this wastewater. This will produce a clean water stream that can be reused, which allows the power station to reduce its raw water intake by up to 3%. Wastes will be generated in the pre-treatment step and crystallization step. This waste will be

in solid form and will consist of the gypsum that will be disposed of at the ash/gypsum disposal facility and the salts from the FDG Sludge which will be disposed of at the Holfontein Disposal Facility. The flow diagram for the FGD Wastewater treatment plant is attached as **Appendix F**.

### **3.12 SPOIL AREAS**

Two separate spoil areas have been developed at Kusile as follows:

- The Concrete Spoil Stockpile which is a mixture of waste containing mostly concrete, unusable soil, rebar (re-enforcing steel) and rubbish; and
- The K3 stockpile which will comprise of silty soils and degradable rock which is not suitable for use as general backfill within the project.

These spoil areas will be temporary. The concrete will be disposed of offsite and the remaining K3 will be spread out and grass will be planted on top.

#### 4. AMOUNTS OF WASTE TO BE DISPOSED OF

It is expected that the ash/gypsum dump will handle approximately 3 600 tonnes of ash and gypsum per day within the first four years, and 21 600 tonnes of ash and gypsum per day at year 5. For the next 5 years (year 6-10), the amounts of gypsum to be handled at the ash/gypsum dump will be 2 783.52 tonnes per day. It is expected that an additional 72 tonnes of gypsum per day will be produced from the FDG as belt filter press sludge.

The rock spoils to be stored daily at Kusile are estimated to be 75 tonnes at the concrete spoil area and 500 tonnes at the K3 spoil area. **Table 4-1** provides a summary of all the waste sites that are being applied for and the total amounts of waste expected to be disposed of at each site.

**Table 4-1: Summary of Waste Sites being applied for**

Waste Site	Size of facility for a waste management activity	Area where the waste management activity takes place	Classification of facility in terms of climatic water balance	Type of Facility	The quantity of waste received
<b>Ash/Gypsum disposal facility</b>	The footprint of the ash/gypsum disposal facility is approximately 250 ha	The ash/gypsum disposal facility will be located on Farm Klipfontein 566JR (Coordinates: 25° 56' 13.05"S, 28° 55' 11.49"E).	The ash/gypsum disposal facility is classified as B <sup>+</sup> (water excess).	Ash is classified as non-hazardous waste and gypsum is classified as a moderate hazardous waste therefore, the mixture is classified as a moderate hazardous waste. The co-disposal of ash and gypsum will require a class H:h (LB <sup>+</sup> ) waste disposal facility.	The total waste storage for the Ash/gypsum disposal facility will be 84 423 000 m <sup>3</sup> .
<b>Ash Dump Dirty Water Dam</b>	The ADDD will be approximately 7.01 ha.	The ADDD will be located on Farm Klipfontein 566JR (Coordinates: 25° 55' 54.17"S, 28° 53' 50.35"E).	The ADDD is classified as B <sup>+</sup> (water excess).	The dirty water collection channels from the Ash/gypsum dump will be routed to the ADDD. The ADDD is therefore classified as a hazardous waste disposal facility. .	The total waste storage volume of the ADDD will be 227 410 m <sup>3</sup>
<b>Station Dirty Water Dam</b>	The footprint of the SDD is approximately 5.615 ha.	The Station Dirty Dam will be located on Farm Hartbeestfontein 537JR (Coordinates: 25° 55' 12.82"S, 28° 53' 50.48"E).	The Station Dirty Water Dam is classified as B <sup>+</sup> (water excess).	The Station Dirty Water Dam is classified as a hazardous waste facility.	The design storage capacity of each dam with the sloping floors is 181 890 m <sup>3</sup> .
<b>Station Dirty</b>	The footprint of the	The Station Dirty Dam	The Station Dirty Dam	The Station Dirty Water	The waste storage volume of the

Waste Site	Size of facility for a waste management activity	Area where the waste management activity takes place	Classification of facility in terms of climatic water balance	Type of Facility	The quantity of waste received
<b>Dam Settling Tank</b>	Station Dirty Dam Settling Tank is approximately 0.8 ha.	Settling Tank will be located on Farm Hartbeestfontein 537JR (Coordinates: 25° 55' 12.82"S, 28° 53' 50.48"E).	Settling Tank is classified as B <sup>+</sup> (water excess).	Dam Settling Tank is classified as a hazardous waste facility.	Station Dirty Dam Settling Tank will be 7 975 m <sup>3</sup> .
<b>Rock Stockpile Areas</b>	The footprint of the Concrete Spoil Stockpile will be approximately 9.6 ha and the K3 stockpile will be approximately 4.84 ha.	The concrete spoil stockpile will be located on Farm Hartbeestfontein 537JR (Coordinates: 25° 55' 2.15" S and 28° 54' 30.33" E) and the K3 spoil area will be located on Farm Klipfontein 566JR (Coordinates: 25° 55' 43.46" S and 28° 55' 4.32" E).	The rock stockpile is classified as B <sup>-</sup> .	The rock stockpile is classified as General Waste. It will primarily consist of silty soils and degradable rock not suitable for use as general backfill.	The total waste storage volume of the concrete spoil stockpile and K3 stockpile will be approximately 229 500 m <sup>3</sup> and 750 000 m <sup>3</sup> respectively

## 5. POTENTIAL ALTERNATIVES

An initial site selection study was undertaken by Eskom with the objective of describing the planning process that has resulted in the geographical area in question being identified for the purpose, as well as initially screening the five potential sites within the geographical area and identifying the two preferred sites that were the subject of the 2006 EIA.

Detailed assessments were undertaken for a number of specialist fields including groundwater, terrestrial ecology, and aquatic fauna and flora.

In essence the overall recommendations which were made during the EIA Phase were that there is no clear distinction between the two sites as their environmental impacts are similar. The preferred site had the following advantages:

- The geology of the preferred site is such that it is unlikely to allow the rapid distribution of pollutants through the groundwater, specifically related to the disposal of ash;
- The preferred site supports a smaller area of high integrity wetlands and offers less wetland services than the alternative site;
- There are fewer sensitive noise receptors that are likely to be affected by a direct dry cooled power station at the preferred site;
- There is less land that is cultivated on the preferred site, especially with respect to irrigated land; and
- The net income per hectare at the preferred site is in excess of 20% lower than the net income per hectare on the alternative site.

While the differences are marginal, it was concluded that the establishment of a coal fired power station on the preferred site is likely to have fewer negative impacts on the biophysical and socio-economic environments. A further conclusion was that it would be important to consider technical, financial and other factors in deciding on which site to pursue.

The specific location of the power station, coal stockyard, above-ground ash/gypsum dump, road access and raw water pipeline corridors as initially identified on the preferred site were refined, to avoid impacting on high integrity wetlands. The ash/gypsum dump design was also further refined to avoid impacting on any wetlands

and a buffer around the wetland as been included in order to preserve and protect the wetland.

## **6. LEGISLATION AND GUIDELINES**

### **6.1 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008)**

The Department of Environmental Affairs (DEA) published a List of Waste Management Activities as contained in a Schedule of the NEMWA in the Government Notice GN. No. 718 of 3 July 2009. The Schedule contains a list of waste management activities which have, or are likely to have a detrimental effect on the environment in terms of Section 19(1) of the NEMWA. The co-disposal of ash and gypsum will require a WML for the following listed activities:

- i) 3 (1) the storage, including temporary storage of general waste at a facility that has a capacity to store in excess of 100 m<sup>3</sup> of general waste at any one time, excluding the storage of waste in lagoons: the temporary storage of the concrete and K3 spoil at Kusile.*
- ii) 4(9) The disposal of any quantity of hazardous waste to land- The co-disposal and storage of approximately 84 423 000 m<sup>3</sup> of ash and gypsum waste, which has been classified as a moderate hazardous waste to land.*
- iii) 4(11) The construction of facilities listed in Category B of the Schedule 1 – The construction of a hazardous waste facility for the co-disposal and storage of ash and gypsum..*

The application for the integrated waste management licence requires an EIA as stipulated in the EIA Regulations made under Section 24(5) of NEMA.

### **6.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)**

The construction of the disposal facility (ash/gypsum dump, ADDD, SDD and SDD ST) and the disposal of the ash and gypsum will be carried out in accordance with the environmental management principles as set out in Section 2 of NEMA, and summarised below:

- Environmental management at Kusile will place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interest equitably;
- The disturbance of ecosystem and loss of biodiversity will be avoided, where this is not possible, the disturbance will be minimised and remedied;
- The pollution and degradation of water resources will be avoided;
- The produced ash and gypsum will be disposed of in a responsible manner;

- The environmental management will be integrated in acknowledgement that all elements of the environment are linked and interrelated;
- The social, economic and environmental impacts will be evaluated and the decisions will be in line with the evaluation process; and
- Work of the site will comply with the Occupational Health and Safety Act, 1993 (Act No. 83 of 1993) (OHSA).

In addition, the application for the WML will comply with the EIA Regulations No. R. 543 of 2010. **Table 1-4** presents how Part 3 of the Chapter 3 of the EIA Regulations (2010) shows where and how compliance was achieved in this report.

### **6.3 NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)**

The disposal of ash and gypsum into the wetland is defined in Section 21 of the NWA as follows:

*21(g) disposing waste or water containing in a manner that may detrimentally impact on the water resource.*

A Water Use Licence Application (WULA) was submitted to the Department of Water Affairs (DWA) to comply with Section 40(1) of the NWA. The Section 21 (g) licence was issued by the DWA on 12 April 2011 (**Appendix G**). According to the Section 21 (g) licence the following is authorised:

#### ***Storage and Disposal of Water Containing Waste***

*The Licensee is authorised to operate and maintain the various pollution control facilities, for the purpose of collection, containment and re-use as specified in the Licence.*

*The Licensee is authorised to irrigate ash/gypsum dumps to suppress dust utilising 246 010 m<sup>3</sup>/a. The irrigation water will be supplied from the ash/gypsum dirty water dam which will be supplemented from the holding/recycling dam when the need arise.*

#### ***Coal Storage Yard***

*The Licensee is authorised to operate 852 000 m<sup>3</sup> of coal storage yard on the farm Hartbeestfontein 537JR, in accordance with provisions made in the Report.*

### **Ash and Gypsum Co-disposal Facility**

*The Licensee is authorised to dispose of a maximum volume of 4 921 295 tons/a of ash/gypsum into the ash/gypsum dump on the farm Hartbeestfontein 537JR in accordance with the provisions made in the Report.*

### **Emergency Ashing Area**

*The Licensee is authorised to operate 13 975 m<sup>3</sup> emergency ashing area on the farm Hartbeestfontein 537JR in accordance with the provisions made in the Report.*

### **Station Dirty Dam**

*The Licensee is authorised to dispose of 284 510 m<sup>3</sup>/a of dirty water into the station dirty dam.*

### **Temporary Stockpiling Course Ash**

*The Licensee is authorised to operate 13 975 m<sup>3</sup> temporary stockpiling course ash facility on the farm Hartbeestfontein 537JR in accordance with the provisions made in the Report.*

### **Station Recycle/Holding Dam**

*The Licensee is authorised to dispose a maximum volume of 78 400 m<sup>3</sup> of water containing waste in the Station Recycle/Holding Dam on the farm Hartbeestfontein 537JR in accordance with the provisions made in the Report.*

### **Pollution Control Dams**

*The Licensee is authorised to operate the following control dams in accordance with the provisions made in the Report;*

- *The station two dirty dam settling facility (2 x 184 453 m<sup>3</sup>) situated on farm Hartbeestfontein 566, Portion 0.*
- *The Coal Stockyard/limestone building settling facility (4 977 m<sup>3</sup>) situated on farm Hartbeestfontein 566, Portion 1.*
- *The two holding/recycle dams (2 x 35 623 m<sup>3</sup>) situated on farm Hartbeestfontein 566, Portion 1.*

## **6.4 THE KYOTO PROTOCOL**

The United Nations Framework Convention on Climate Change (UNFCCC) and the subsequent Kyoto Protocol is an attempt to address global warming. South Africa ratified the Convention on 29 August 1997. The Kyoto Protocol was adopted at a

Conference of the Parties to the UNFCCC in Kyoto, Japan in December 1997. The conference resulted in a consensus decision to adopt a protocol under which industrialised countries will reduce their combined greenhouse gas emissions by at least 5% compared to 1990 levels in the period 2008 to 2012.

In developing the Kyoto Protocol, the need to promote sustainable development was recognised. This means implementing policies and measures to, among others, enhance energy efficiency, protect and enhance sinks and reservoirs of greenhouse gases, promote sustainable forms of agriculture, increase the usage of new and renewable forms of energy and of advanced, innovative and environmentally sound technologies. The Kyoto Protocol is a legally binding instrument. In response, South African policies are starting to place emphasis on cleaner technology and production, and a shift to sustainable development.

Eskom works closely with the DEA to realise the strategic objectives, principles and proposals of the national Climate Change Response Strategy. The strategy is a broad framework for formulating, implementing and regularly updating national and, where appropriate, regional programmes to mitigate climate change

## **6.5 GUIDELINE DOCUMENTS**

The following guideline documents were considered in the compilation of this report:

- General Notice 654 of 29 June 2010, National Environmental Management Act (107/1998): Publication of Implementation Guidelines: For general public comments. Government Gazette 33333.
- DEA (2002): Scoping, Integrated Environmental Management, Information Series 2, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2002): Stakeholder Engagement, Integrated Environmental Management, Information Series 3, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2002): Specialist Studies, Integrated Environmental Management, Information Series 4, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2002): Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2002): Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism, Pretoria.

- DEA (2002): Criteria for Determining Alternatives in EIA, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2006): General Guide to the EIA Regulations (Guideline 3), Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2006): Public Participation (Guideline 4) in support of the EIA Regulations, Department of Environmental Affairs and Tourism, Pretoria.
- DEA (2006): Assessment of alternatives and impacts (Guideline 5) in support of the EIA Regulations, Department of Environmental Affairs and Tourism, Pretoria.
- IAIA in cooperation with Institute of Environmental Assessment (1999): Principles of EIA Best Practice. [www.iaia.org](http://www.iaia.org).

## **7. DESCRIPTION OF THE RECEIVING ENVIRONMENT**

This section provides a description of the project area's climate and baseline environment and conditions.

### **7.1 CATCHMENT**

The site falls within the B20F water quaternary catchment and the larger Wilge River catchment in the Upper Olifants sub-area of the Olifants Water Management Area.

### **7.2 CLIMATE**

#### **7.2.1 Regional Climate**

The project area displays the warm summers and cold winters typical of the Highveld climate. The average summer and winter daytime temperatures are 25 °C and 20 °C, respectively. Rainfall occurs mainly as thunderstorms and drought conditions occur in approximately 12 % of all years. The Environmental Potential Atlas for Mpumalanga and Gauteng places rainfall at site as ranging between 621 mm and 750 mm per year. The prevailing wind direction is north-west during the summer and east during winter. Winds are usually light to moderate. The Mean Annual Evaporation in the area is 707 mm/a (1 532 mm/a – S Pan).

#### **7.2.2 Rainfall**

Rainfall is strongly seasonal with most rain occurring in the summer period (October to April). The maximum rainfall occurs during the November to January period. Whereas summer months receive about 80 % of the rainfall, winter months are normally dry.

The area experiences an average rainfall of 682 mm per annum. The majority of summer rain falls in early to mid-summer, November, December and January. The driest months fall in mid-winter, June to August, when less than 10 mm of rain falls on average.

### **7.3 SOIL AND LAND CAPABILITY**

The University of the Free State conducted an agricultural impact study to provide input to the Environmental Impact Assessment during September 2006. The main findings with regard to soil potential and land capability include (Jordan, 2006):

- Based on on-site inspection, satellite imagery as well as data received from individual farmers, 27 % of land was cultivated for dry land purposes;
- The land use patterns showed livestock farm activities on site;
- The site was noted to have a few good quality farm dwellings and sheds, with livestock

- handling facilities on nearly all farms and one irrigation system; and
- Farmers at the site indicated their average yields for the past three years as between 3.5 and 5 tons per ha.

The average gross margin revenue for the Kusile site was calculated to be R 749 per hectare. Total loss in gross agricultural production was calculated to be R 289 million (Jordan, 2006). The net present value (NPV) at a discount rate of 10 % was calculated to be R 70.7million, while the loss in total net income was determined to be R 150 million. The NPV of net income calculated at a discount rate of 10% per annum was calculated to be R 36.6 million (Jordan, 2006).

#### **7.4 TOPOGRAPHY**

The surface topography consists of a gently undulating plateau of the Highveld region with gently sloped hills. The highest point of the site lies at a height of 1 520 meters above mean sea level (mamsl) on the eastern section of the site. The lowest point on the site is at a height of 1 440 mamsl on the western section of the site.

#### **7.5 GEOLOGY**

The site is underlain by geology of the Karoo Sequence and Pretoria Group with diabase intrusions. A large part of the Kusile Power Station Site is underlain by the Dwyka and Eccca Formations of the Karoo Sequence and the Rayton Formation of the Pretoria Group. The Karoo Sequence overlies the Pretoria Group. Diabase sills intrude the Rayton as well as the Dwyka Formation in the investigated site area.

#### **7.6 SURFACE WATER HYDROLOGY**

The site falls into the Quaternary Catchment B20F which forms part of the larger upper Olifants River Catchment. The Upper Olifants River Catchment is defined as the drainage area upstream of Loskop Dam. The catchment has three major sub-drainage areas associated with the Olifants River, viz. the Klein-Olifants River, Wilge River and the Klipspruit. The main surface dams in the catchment include Loskop Dam, Witbank Dam, Bronkhorstspruit Dam and Middelburg Dam.

The Klipfonteinspruit and Holfonteinspruit flows through the site, along with unnamed tributaries of these rivers. All of these watercourses are perennial and are fed by groundwater and eventually flow into the Wilge River. The Wilge River flows in a northerly

direction and drains into the Olifants River. There are also various small farm dams on the site as shown on the figure below.

## **7.7 SENSITIVE AREAS**

Ecosun conducted an ecological assessment to provide input into the Environmental Impact Assessment. This included the identification and assessment of the integrity of wetlands on the Kusile site.

Ecosun identified six different wetland types (Ecosun, 2006):

- Channelled valley bottom;
- Hillslope feeding a watercourse;
- Hillslope not feeding a watercourse;
- Non channelled valley bottom;
- Floodplain; and
- Depression wetlands.

Ecosun classified these wetlands in terms of high, medium and low ecological integrity, and determined that the general integrity of these wetlands could be regarded as impaired with only two wetland sections of high integrity.

## **7.8 GROUNDWATER**

The site is underlain by geology of the Karoo Sequence and Pretoria Group with diabase intrusions. Hydrogeologically, the site is composed of two layers: the upper unconfined aquifer that extends to a depth of 30 m, followed by a 70 m thick confined/unconfined aquifer.

A good correlation (97.6 %) between the topography and groundwater elevation indicates that the top aquifer is indeed unconfined.

The groundwater depth ranges from -0.35 (artesian) to 25 m with an average of 8 m. The regional groundwater flow is directed from south-east to the north-west. However, on a local scale the flow could be directed differently but is primarily directed to the streams as the source of these streams is a combination of rainfall and groundwater base flow.

## **8. PUBLIC PARTICIPATION PROCESS**

### **8.1 BACKGROUND**

The public participation process (PPP) is important to acquire the inputs from the potentially Interested and Affected Parties (I&APs). This is to ensure the environmental rights of the people are protected as contained in Section 24 of the Constitution of the Republic of South Africa, 1996 (No. 8 of 1996), as follows:

*Everyone has the right –*

- (a) to an environment that is not harmful to their health or wellbeing; and*
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*
  - i) prevent pollution and ecological degradation;*
  - ii) promote conservation; and*
  - iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

### **8.2 OBJECTIVES**

The objectives of the public participation, based on the IAIA publication of *Public Participation – Best Practice Principles* (IAIA, 2006), are –

- To invite the I&APs to participate into the decision-making process to promote environmental justice, equity and collaboration;
- To inform the stakeholders, (which includes the proponent, general public, and decision-makers) on the planned activity and its consequences;
- To gather data and information from the public about their human (including cultural, social, economic and political dimensions) and biophysical environment, as well as about the relations they have with their environment;
- To seek input from the public on the planned activity, including its scale, timing and ways to reduce its negative impacts, to increase its positive outcomes or to compensate impacts which may not be mitigated;
- To contribute to more sustainable development and consequently greater public acceptance and support; and
- To contribute to the mutual learning of stakeholders and to improvement of the public participation.

### **8.3 THE PROCESS FOLLOWED**

Necessary measures were taken to ensure that the PPP complies with Regulation 56 of the EIA Regulations No. R. 543 of 2010. On-site notices were placed at the entrance and around the Kusile Power Station on 12 April 2013 (**Figure 8-1**).

**Figure 8-1: Site notices placed at and around the Kusile Power**

A newspaper advertisement was placed in the Sowetan and Citizen publications on 12 April 2013. **Figure 8-2** shows the advertisements that were placed in the newspapers.

**Figure 8-2: Newspaper Advertisements**

Notification letters and the Background Information Documents (BIDs) were sent to the potential I&APs listed in **Appendix H**.

#### 8.4 COMMENTS FROM I&APS ON THE DRAFT REPORT

On 15 April 2013 the Draft Scoping Report was placed on Sebata Institute website ([www.sebatagroup.com](http://www.sebatagroup.com)) and the Eskom website ([www.eskom.co.za](http://www.eskom.co.za)) for a period of 40 days. An e-mail was sent to the registered stakeholders to inform them about the availability of the draft report. A feedback letter was attached to the e-mail, whilst the website links were included in the body of the e-mail for convenience. One copy of the report was made available to stakeholders at the Kusile Power Station. I&APs were also informed that electronic copies of the report on CD were available on request.

Copies of the Draft Scoping Report were also made available to the following Government Departments:

<b>Department</b>	<b>Contact Person</b>
Department of Environmental Affairs	Ms Kim Balutto
Department of Water Affairs (Bronkhorstspuit Office)	Mr Madi Maloto
Mpumalanga Department of Agriculture, Rural Development and Land Administration (DARDLA	Ms N.L Sithole
Mpumalanga Department of Economic Development, Environment and Tourism;	Ms Dineo Tswai
South African Heritage Resources Agency (SAHRA)	A case was opened on SAHRIS
Delmas Local Municipality.	Ms Yolanda Pulasegami

## **9. SUMMARY OF THE ISSUES IDENTIFIED**

### **9.1.1 Heritage Resources**

Heritage resources are broadly defined as all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, features and objects of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.

An assessment of the project site conducted during the 2006 EIA revealed that there were no features or objects dating to the Stone Age or the Iron Age. However a suite of remains dating to the Historic Period (1840's to present day) were identified. These were divided into two categories of remains; namely farmsteads/homesteads and cemeteries/ graves. A total of 26 sites were identified, consisting of 5 farmsteads/homesteads, and 21 grave/cemetery sites. A Late Victorian style house constructed in the 1890's is located on farm Hartbeestfontein 537 JR. An old farmstead and barn dating to 1904 are also located on the same farm. None of these sites were deemed to be of such importance as to prevent the development from proceeding.

Since the Heritage Impact Assessment (HIA) conducted in 2006 included the area affected by the ash disposal facility, it is the considered opinion of the EAP that no further HIA will be necessary for this application.

An additional Heritage Impact Assessment was also conducted in 2012. The 2012 HIA confirmed the findings of the 2006 HIA.

### **9.1.2 Waste Classification**

The waste classification for the co disposal of ash and gypsum was conducted in terms of the DWA Minimum Requirements. The initial waste classification categorised the ash/gypsum to be disposed of at the ash/gypsum dump to be medium hazardous (Hh<sup>+</sup>). In terms of the DEA regulations, the ash/gypsum to be disposed of at the ash/gypsum dump can be classified as a Class A waste.

Although in terms of the minimum requirements for a hazardous waste, the ash/gypsum dump requires a 3 layer lining system with leakage detection, the ash/gypsum dump at Kusile will be situated in a water deficit area and the co-disposal facility is a dry dump (15% moisture content). The lining system to be used

will be designed in accordance with the DWA Minimum Requirements for Waste Disposal by Landfill (1998)", and will be subject to DWA approval. The ash disposal facility will have an irrigation and dust control management plan to ensure that a phreatic surface (surface saturated with water) does not develop.

The seepage from the drainage layer will be discharged to the dirty water system. A groundwater drainage system will be provided under the liner system in areas where the natural water table is shallow. Collected groundwater will be discharged to the clean water system. A system of concrete lined dirty water culverts and pipes will channel the dirty stormwater run-off from the active part of the dump and from the area in the process of rehabilitation to the ADDD.

It is the opinion of the EAP that the waste classification conducted was sufficient and therefore no further classification will be necessary for this application. It is also the opinion of the EAP that the proposed ash disposal facility design is sufficient to protect the environment from any negative impacts.

## **9.2 POTENTIAL IMPACTS**

The following potential issues were identified by the EIA team and will be considered in the assessment phase:

- Groundwater Quality;
- Surface Water Quality;
- Air Quality;
- Aquatic Ecology; and
- Terrestrial Ecology

### **9.2.1 Groundwater Quality**

According to the specialist studies that were conducted in 2006 for the whole Kusile project, above-ground co-disposal of ash is expected to have an impact on groundwater. The study found that the study area is underlain by younger Dwyka Group tillite and Karoo sediments and the hydrogeology on the majority of the site comprises a non-aquifer system, with very low yielding boreholes and limited groundwater potential. There is little or no groundwater use occurring within the site; however, persistent contamination can have an impact on the groundwater users with time. It was concluded that groundwater can be impacted on by the proposed power station and infrastructure; causing elevated groundwater levels and altering hydrochemistry. An initial risk assessment identified that sources of artificial

recharge, such as an unlined ash/gypsum dump or dirty water dams, require risk reduction measures.

### **9.2.2 Surface Water Quality**

The position of the ash/gypsum disposal facility (ash/gypsum dump, ADDD, SDD and SDD ST) makes the wetlands and water resources susceptible to pollution during construction and operation. Sources of pollution include dust generated during construction activities, sediments, leaked hydrocarbons, litter and construction materials. Indirect impacts associated with an above ground ash/gypsum dump on the water quality include the impacts of dust blown from the dump increasing sediment levels of water resources and thereby impacting on the turbidity of the resource.

A Specialist Wetland Offset Report will be submitted to DEA as part of the 60-year Ash Dump EIA process. With the sensitivity surrounding the transformation of wetlands within the Kusile footprint as well as the DWA's initial discussion regarding offsets, Eskom staff and the Environmental Assessment Practitioner (EAP), Zitholele, have authorised a Wetland Offset Report to be included as an additional specialist report for the 60 Year Ash Dump EIA process. The Wetland Offset Report will be conducted by Prime Africa Consultants and will identify possible wetland areas, which are suitable for offset consideration. The study will make use of the current delineation and classification study and will be based on the Guideline for Wetland Offset developed by SANBI. Findings from the offset study will be incorporated into the EIA Report and will also inform the EMPr for this application.

Sebata is also in the process of compiling a Wetland Management Plan as part of the application for environmental authorisation that was submitted and approved by the DEA on 5 April 2013 for construction within wetlands and crossing of rivers and wetlands at the Kusile Power Station. This Wetland Management Plan will include the wetland affected by the ADDD and will be submitted to the DEA for approval.

### **9.2.3 Air Quality**

The ash/gypsum to be disposed of at the ash/gypsum dump may present dust nuances. There are some measures in place to mitigate against the generation of dust which include:

- Additional storage of water for dust control and irrigation over the active disposal area and the rehabilitation establishment zone is provided in the ADDD for 72 hours.
- The maximum 72 hr dust suppression and irrigation volume is approximately 2 562 m<sup>3</sup>. The maximum pumping capacity from the ADDD is 37 l/s.
- Based on the maximum pumping capacity, the operating storage was set at 6 480 m<sup>3</sup>, which is equivalent to 72 hrs of pumping at 25 l/s.
- The dust control and irrigation storage volumes are based on 1 mm/day of equivalent rainfall.  
(1 mm/day is equivalent to 0.5 x the average annual daily rainfall at Kusile Site).
- The dust suppression for the paddocks will be performed by the sprinkler system and will need to cover the following areas simultaneously (at maximum):
  - Two paddocks. The paddocks will typically be 200 m x 200 m in length and width and will increase in height by 1 m intervals. The paddocks at the edge of the dump will typically be 100 m x 400 m in width and length and will increase in height by 1 m intervals. All paddocks are considered to have a footprint area of approximately 40 000 square meters.
  - All active side slopes (sprinklers to be placed along the crests of the side slopes diameter widths apart attached to drag lines enabling the sprinklers to be moved vertically along the side slopes).
  - A 300 m x 30 m area for irrigation to assist rehabilitation.
- The dust suppression system will have the capacity to fill the trucks/bowsers at the same time as covering the above areas with the sprinklers

Dust suppression of the disposal facility at finished height will be controlled by a 100 mm permeable blanket layer of gravel, followed by topsoiling and grassing. Rehabilitation establishment will take three years, developed progressively as each section of the dump is finalised

#### **9.2.4 Aquatic Ecology**

The ash/gypsum disposal facility will be constructed around medium integrity wetlands and is therefore expected to have an impact on aquatic ecology. The position of the ash/gypsum dump makes the wetlands and water resources susceptible to pollution during construction. Sources of pollution include dust generated during construction activities, sediments, leaked hydrocarbons, litter and construction materials. Indirect impacts associated with an above ground

ash/gypsum dump on the aquatic ecological environment include the impacts of dust blown from the dump increasing sediment levels of aquatic systems, resulting in loss of habitat due to smothering, increased turbidity, decreased photosynthesis and physiological stress on organisms.

### **9.2.5 Terrestrial Ecology**

The project site is mostly disturbed through agricultural activities, with little natural vegetation remaining. There are however a range of protected species occurring on the project site, including six protected plant species and one red data bird species. During the construction phase, it is possible that the contractor may remove more vegetation cover than is required to establish the power station and its associated infrastructure, with the potential to impact on the identified protected plant species, with knock-on effects for the animals that utilise that habitat.

Kusile appointed an Ecologist to conduct a search and rescue of protected species at the construction sites.

### **9.2.6 Construction related impacts**

Construction can be a noise and dust producing activity which may cause a nuisance to people living in the vicinity. These impacts, however, can be mitigated and managed to acceptable levels, with a post mitigation impact that is not significant. No specialist studies will be undertaken, but the mitigation measures necessary to maintain acceptable levels of noise and dust will be included in the EMP for the construction phase.

All the specialist reports from the 2006 EIA process are attached as **Appendix I**.

## **10. PLAN OF STUDY FOR EIA**

During the 2006 EIA for the whole project, extensive specialist studies were conducted, including collection of baseline data and quantification of impacts of the proposed development on the environment. These specialist studies included:

- Geotechnical study;
- Traffic study;
- Air quality assessment;
- Visual impact assessment;
- Noise impact assessment;
- Terrestrial ecology assessment;
- Aquatic ecosystem assessment;
- Groundwater assessment;
- Social risk / Vulnerability study;
- Heritage assessment;
- Agricultural potential assessment;
- Socio-economic assessment; and
- Planning study.

Eskom is also currently implementing water quality and groundwater monitoring programmes around the Kusile Project area, including the areas affected by the ash/gypsum disposal facility.

### **10.1 SPECIALIST STUDIES**

The following specialist studies are expected to be required for this project:

- Groundwater
- Surface water
- Terrestrial Ecology
- Aquatic Ecology; and
- Air Quality.

Suitably qualified specialists will be appointed to conduct the specialist studies. However since the baseline data for the project area was collected during the 2006 EIA and the ongoing Kusile monitoring programmes, the specialist studies for this application will not require field work. Specialists will conduct desktop studies of the

available information and based on that conduct a risk assessment of the proposed project.

The risk assessment of the proposed project will be conducted in an interactive manner (workshop session) and will make recommendations as to whether or not the proposed project is the best alternative. Specialists will also be required to recommend mitigation measures that may be applied to minimise the significance of any identified negative impacts.

## 10.2 PUBLIC PARTICIPATION PROCESS

Interested and Affected Parties (I&APs) were notified of the project and invited to submit comments by way of:

- Notification letters and BID that were sent to I&APs on 12 April 2013;
- On-site notices that were placed at and around the Kusile Power Station on 12 April 2013; and
- Newspaper advertisements that were placed in the Sowetan and the Citizen publications of 12 April 2013.

The public participation process will, continue to provide I&APs with the opportunity to participate in the process.

A proposed programme is presented in **Table 10-1**.

**Table 10-1: Proposed Programme**

<b>Task</b>	<b>Completion Date</b>
DEA Accepts Application	14 March 2013
Draft Scoping Report	20 March 2013
Sebata/Eskom Review	25 March 2013
Draft BID for Eskom to review	20 March 2013
Draft adverts, on-site notice and letters for client approval	20 March 2013
Approval of advert, letters and BID	25 March 2013
Post letters/send e-mails. post advertisements	12 April 2013
Advertisements in papers	By 12 April 2013
Public Comment Period (40 Days)	15 April -3 June 2013
Government Comment Period (60 days for DWA)	15 April -28 June 2013
Issues and Responses Report	5 July 2013

<b>Task</b>	<b>Completion Date</b>
Finalise Scoping Report	10 July 2013
Inform Stakeholders of the availability of Final Scoping report and Issues and Responses Report for Comment	16 July 2013
Public Comment Period on the Final Scoping Report (21 Days)	Ends 9 August 2013
Signatures and Submission	16 August 2013
Authority review	15 October 2013
Specialist Briefing Meeting	22 October 2013
Specialist opinions completed	22 November 2013
Compile Draft EMP	29 November 2013
Compile Draft EIR	10 December 2013
Sebata/Eskom Review	13 December 2013
Draft Notification letters, advertisement and on-site notices	8 January 2014
Sebata/Eskom Review	10 January 2014
Post letters/send e-mails. post advertisements	17 January 2014
Adverts in the papers	By 17 January 2014
Public Comment Period	6 January to 17 February 2014
Government Comment Period (60 days for DWA)	6 January to 10 March 2014
Issues and Responses Report	17 March 2014
Finalise EMP	24 March 2014
Finalise EIR	31 March 2014
Sebata/Eskom Review	7 April 2014
Inform Stakeholders of the availability of Final Reports (EIR, EMP) for Comment	14 April 2014
Public Comment Period on the Final Scoping Report (21 Days)	Ends 12 May 2014
Submit Final EIR to DEA	19 May 2014
Approval from DEA	Not known
Registered letters to stakeholders	Within 10 days of authorisation

A copy of the draft EIA report, EMP and specialist studies will be placed at the Kusile Power Station offices and on the Eskom and/or ILISO website. Electronic copies on CD will also be available on request. Registered I&APs will be notified by e-mail, fax or post, depending on their contactability, of the opportunity to comment on the reports. Comments can be submitted by writing a letter, sending a fax, sending an e-mail or calling the EAP telephonically. Focus Group Meetings will be arranged if requested by stakeholders. All comments received, together with the responses provided, will be appended and/or incorporated into the final report, in line with Regulations 58(4) and 59 of the EIA Regulations No. R 543 of 2010.

### **10.3 AUTHORITY CONSULTATION**

An Integrated Waste Management Licence Application Form was submitted on 23 July 2012 and resubmitted on 17 August 2012 in compliance with Regulation 27(a) & (b) (i) of the EIA Regulations No. R 543 of 2010. An amended application form was submitted to the DEA on 28 February 2013.

Upon the receipt of the amended integrated waste management licence application, the competent authority identified the responsible officer (Ms. Kim Balutto) who is charged with the processing of the application.

Liaison with the responsible officer will be maintained throughout the application process.

The Scoping Report will be submitted to the competent authority once the public comment period has lapsed, and the received comments have been incorporated into the report. After the competent authority has approved the Scoping Report, the Environmental Impact Report (EIR) will be compiled and submitted to the competent authority for a decision on the integrated waste management licence.

## 11. CONCLUSION AND RECOMMENDATIONS

The co-disposal of gypsum with ash at the Kusile Power Station is not authorised in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008). Since gypsum is considered to be a hazardous waste, a Waste Management Licence (WML) must be applied for to co-dispose ash and gypsum as a listed activity 9, Category B of GN718. The construction of the facility (ash/gypsum dump, the ADDD, the SDD and SDD ST) will trigger activity 11, Category B of GN 718. Act. NEMA listed activities 11 and 18 of GN R544 will be triggered as a result of the construction of the ADDD within a wetland.

I&APs have been notified of the project and invited to submit comments. The public participation process will continue to provide I&APs with the opportunity to participate in the process.

The possible impacts of the proposed project include:

- Waste Classification;
- Groundwater Quality;
- Air Quality;
- Surface Water Quality;
- Aquatic Ecology;
- Heritage Resources;
- Terrestrial Ecology; and
- Construction nuisance related impacts such as noise and dust.

Comprehensive specialist studies were conducted during the 2006 EIA and thus some of the possible impacts of the proposed project will not need to be re-evaluated. It is the considered opinion of the EAP that the following impacts will not require any further assessment:

- Waste Classification; and
- Heritage Resources.

Detailed baseline information was collected during the 2006 EIA and the ongoing water and groundwater monitoring programmes that Eskom is undertaking. It will therefore not be necessary for the specialists to gather further baseline data. The specialists will be expected to conduct desktop studies and conduct a risk assessment of the proposed waste activities. The specialists will also be expected to

recommend mitigation measures that may be implemented to minimise the significance of or avoid any identified negative impacts.

The requirements of the EIA Regulations have been fulfilled in the Scoping process and the EAP recommends that the authority authorises the commencement of the Impact Assessment phase to be executed according to the Terms of Reference presented in this report.

## 12. REFERENCES

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National Environmental Management: Waste Act, 2008 (Act 59 of 1998)

# **APPENDIX A**

## **2006 EIA REPORT**

# **APPENDIX B**

## **ENVIRONMENTAL MANAGEMENT PROGRAMME**

# **APPENDIX C**

## **ENVIRONMENTAL AUTHORISATION**

## **APPENDIX D**

# **2010 KUSILE WASTE MANAGEMENT LICENCE**

# **APPENDIX E**

## **DESIGN REPORTS**

# **APPENDIX F**

## **FDG PROCESS FLOW DIAGRAM**

# **APPENDIX G**

## **WATER USE LICENCE**

# **APPENDIX H**

## **LIST OF KUSILE STAKEHOLDERS**

Number	Farm	Portion	Registered Property Owner
1	Klipfontein 568 JR	3	Truter Boedery
2		8	Cherry Andre
3		34	Doman Petrus Jacobus Bernardus
4			Barry Doman
5		31	Kendal Poultry Farm Pty Ltd
6		9	Cherry Andre
7		14	Anglo American Inyosi Coal Pty Ltd
8		10	Cherry Andre
9	Honningkranz 536 JR	1	Anglo American Inyosi Coal Pty Ltd
10	Eenzaamheid 534 JR	59	Witbank Brickworks 1961 Pty Ltd
11		39	Boshoff Jan Hendrik
12		40 37 59	Witbank Brickworks 1961 Pty Ltd
13		3	Heerdeen Frederik van
14		3	Owen Nelson
15		3	Owen Nelson
16		3	Enoch Masilela
17			Enoch Masilela
18			Enoch Masilela
19		68	Midnight Star Trading 343 CC
20		5	CA van Zyl

Number	Farm	Portion	Registered Property Owner
21		4	Joseph Mohlape & Petros Sibanyouni
22		64	Marabe Erastus Mogorosi
23		Remainder	Roets Hendrik Andre
24		5	Hennie & Addelle Pienaar
25	Witpoort 563JR	7	Roets Ruan Fenning
26	Kortfontein 530JR	2	Geelbooi Masango
27			Johan Coetzee
28		4	Witbank Brickworks 1961 Pty Ltd
29	Harbeesfontein 537 JR		Anglo American Inyosi Coal Pty Ltd
30	Harbeesfontein 537 JR	3	Kusile/Eskom Hartbeesfontein Quarry an Afrimat Quarry
31	B Winning		Victor de Freitas
32	Onverwaght 532JR		Peter Gluntzer
33	Onverwaght 532JR		Manie Venter
34	Onverwaght 532JR		Misty Lake Farm Mduduza Kunene (083 443 2006)
35	Onverwaght 532JR/17 & 537JR/20		HFC Venter
36	Onverwaght 532JR/152		(152 A Suikerbosfontein farm) Moses Kosana

Number	Farm	Portion	Registered Property Owner
37	Onverwaght 532JR/11		Len Ditchfield
38	Kortfontein 530JR/5		HP Sharp
39	Bosmanskraal 538JR & 539 JR		Theo and Christof Pretorius
40	Bosmanskraal 538JR & 539 JR		APG Terblanche
41	Dwaalklip 565JR/20		Truter Boedery
42	Dwaalfontein 565JR/3		Truter Boedery
43	Dwaalfontein 565JR/3		Truter Boedery
44	Dwaalfontein 565JR		Kobus Joubert
45	Klipfontein 566JR/59		Rita Kruger
46	Klipfontein 568JR		CL Slabbert
47	Klipfontein 566JR (8, 10, 7)		FS & JC Frik Viviers
48	Klipfontein 568JR		Anglo American Inyosi Coal Pty Ltd
49	Klipfontein 568JR		Malachite Mining
50	Klipfontein 568JR		Fairdeal Supermarket and Takeaways
51	Klipfontein 568JR		Stille Eden rents from Anglo. Contact Sonja for the Estate Manager's details Fanie Kitching
52	Klipfontein 568JR/ 5 & 568/30		
53	Klipfontein 568 JR/34		Anglo American Inyosi Coal Pty Ltd is the owner but Barry & Irene is renting it

Number	Farm	Portion	Registered Property Owner
54	Klipfontein 568JR/34		Anglo American Inyosi Coal Pty Ltd is owners Barry & Irene is the renting it from Anglo
55	Klipfontein 568JR 2 & 34		Barry Doman
56	Klipfontein 568JR/ 33		Frans Prinsloo
57	klipfontein 568JR		Anglo American Inyosi Coal Pty Ltd
58	Klipfontein 568JR		Zhephs Skosana Owner
59	Klipfontein 568JR		Waaaars Jy Vakansie Oord Kobus & Louise Herbs
60	Klipfontein 568JR		Simon Marothi
61	Klipfontein 568JR		Simon Marothi's
62	Klipfontein 568JR		Truter Boedery
63			Anglo American Inyosi Coal Pty Ltd
64	Bospoort 211JR		Department of Culture Sport & Recreation Delmas Campsite
65	Boshpoort 211JR		Department of Culture Sport & Recreation Delmas Campsite
66	Boshpoort 211JR		Department of Culture Sport & Recreation Delmas Campsite
67	Boshpoort 211JR 1/14/16		Kuiper Group - Hy Lay Pty Ltd
68	Dwarsfontein 209IR		Owner - Riaan Joubert
69	Dwarsfontein 209IR		Truter Boedery
70	Brakfontein 559JR		Martie Richleu
71	Nooitgedacht 564JR		Pierre Pieters
72	Brakfontein 559JR		JC Backhoff
73	Blesbokfontein 558JR		Wikus Lock
74	Blesbokfontein 558JR		Golden Pond Farm 29 Arbor Road

Number	Farm	Portion	Registered Property Owner
75	Witpoort 563JR		Hannes Joubert
76	Witpoort 563JR		Roets Boerdery Andre Roets
77	Witpoort 563JR (Stanely farm)		Hendrik Kok
78	Witpoort 563JR		Andre van Vuuren
79	Witpoort 563JR		Hentie Boshoff

# **APPENIDX I**

## **2006 SPECIALIST STUDIES**