

Received  
28-07-04


# GROOTVLEI POWER STATION

## ENVIRONMENTAL MANAGEMENT PLAN

GEM04\_R017



AUTHOR:

  
ATTIE GOOSEN  
CONSULTANT

ACCEPTED BY

  
DEIDRE HERBST  
ENVIRONMENTAL MANAGER

APPROVED BY:

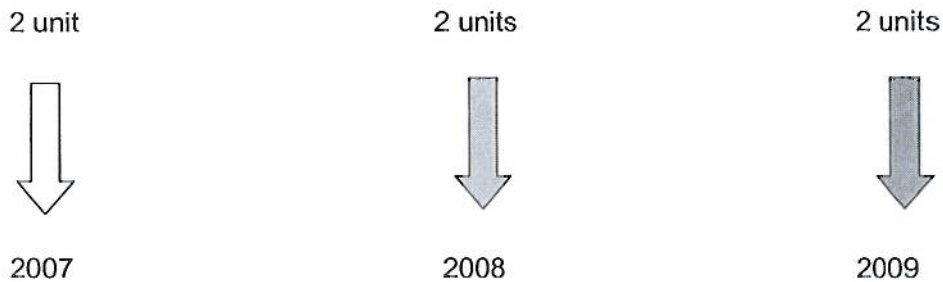
  
DAVE WYNNE  
RETURN TO SERVICE MANAGER

<b>Table of Contents</b>	<b>Page</b>
Introduction	4
Section A: General Information	5
1 Background Information	5
2 Description of Activities	8
3 Description of Environment	9
4 Social Issues	9
Section B: General Operating Practices	14
1 Proposed Organisational Structure	14
2 Responsibilities	15
3 Aspects	16
Section C: General EMP Specifications during Refurbishment	22
1 Air Quality	22
2 Water	23
3 Natural Environment	24
4 Waste	24
5 Land Management	25
6 General	25
Section D: General EMP Specifications during Operation	28
1 Air Quality	28
2 Water	28
3 Waste	29
4 Land Management	30
Table 1: Background information	6
Table 2: Summary of Employment Activities	11
Table 3: Summary of social impacts	14
Figure 1: Aerial Photograph of Grootvlei Power Station	8

## INTRODUCTION

This environmental management plan (EMP) contains the environmental management plans for the return to service of Grootvlei Power Station and includes the refurbishment and operational phases of the project. The power station will be returned to service in a phased approach. Activities for refurbishment are planned, pending permission from the Department of Environmental and Conservation (Mpumalanga), during 2007.

The graphic below depicts the proposed return to service start-up sequence for Grootvlei Power Station.



An Environmental Management Plan and ISO 14001 system is in place for the current activities on site. When activities commence for the refurbishment of the first unit, the existing ISO 14001 systems will be reviewed and appropriately revised. The systems will include all environmental aspects identified during the Environmental Risk Assessment completed by AJ Goosen Consulting Services and the requirements of this EMP. In addition to this an Environmental Management Programme will be developed in which the actions and related responsibilities will be clearly defined.

**SECTION A**  
**GENERAL INFORMATION**

**1. BACKGROUND INFORMATION**

- 1.1 Holding Authority : Eskom – Generation Division  
Megawatt Park PO Box 1091  
Maxwell Drive Johannesburg  
Sunninghill 2000
- 1.2 Contact person : Ms D Herbst  
Generation Environment Manager  
Megawatt Park  
Maxwell Drive, Sunninghill  
Phone: (+2711) 800 3501  
Fax: (+2711) 800 5140
- 1.3 Site : Grootvlei Power Station
- 1.4 Regional Authority : Dipaliseng Town Council
- 1.5 Nearest Towns : Balfour – 18km north east of power station  
Villiers – 30km south of power station  
Heidelberg – 40km north of power station  
There are informal settlements within a 10 km radius of the power station.
- 1.6 Infrastructure : Grootvlei Power Station is situated approximately 3km from the N3 highway and is connected to it by means of a tarred road. There is also a secondary tarred road connecting the site with the R51 and R53. Water is supplied to the adjoining township, and sewage is returned to the sewerage works of the power station.

The railway line from Balfour to Bethlehem passes the station.

A water pipe line conveys water from the Vaal Dam to the terminal reservoirs.

400kV and 88kV power lines exist.

1.7	Latitude & longitude	:	26° 46' S & 28° 29' E
1.8	Landowner	:	The power station is situated on the farm Grootvlei Power Station, ERF 458 IR, Title deed number CCT50784/1983. Eskom is the landowner.
1.9	River catchment	:	Mid-Vaal
1.10	Map	:	Figure 1: Aerial Photograph of Grootvlei Power Station

*Table 1: Background information*

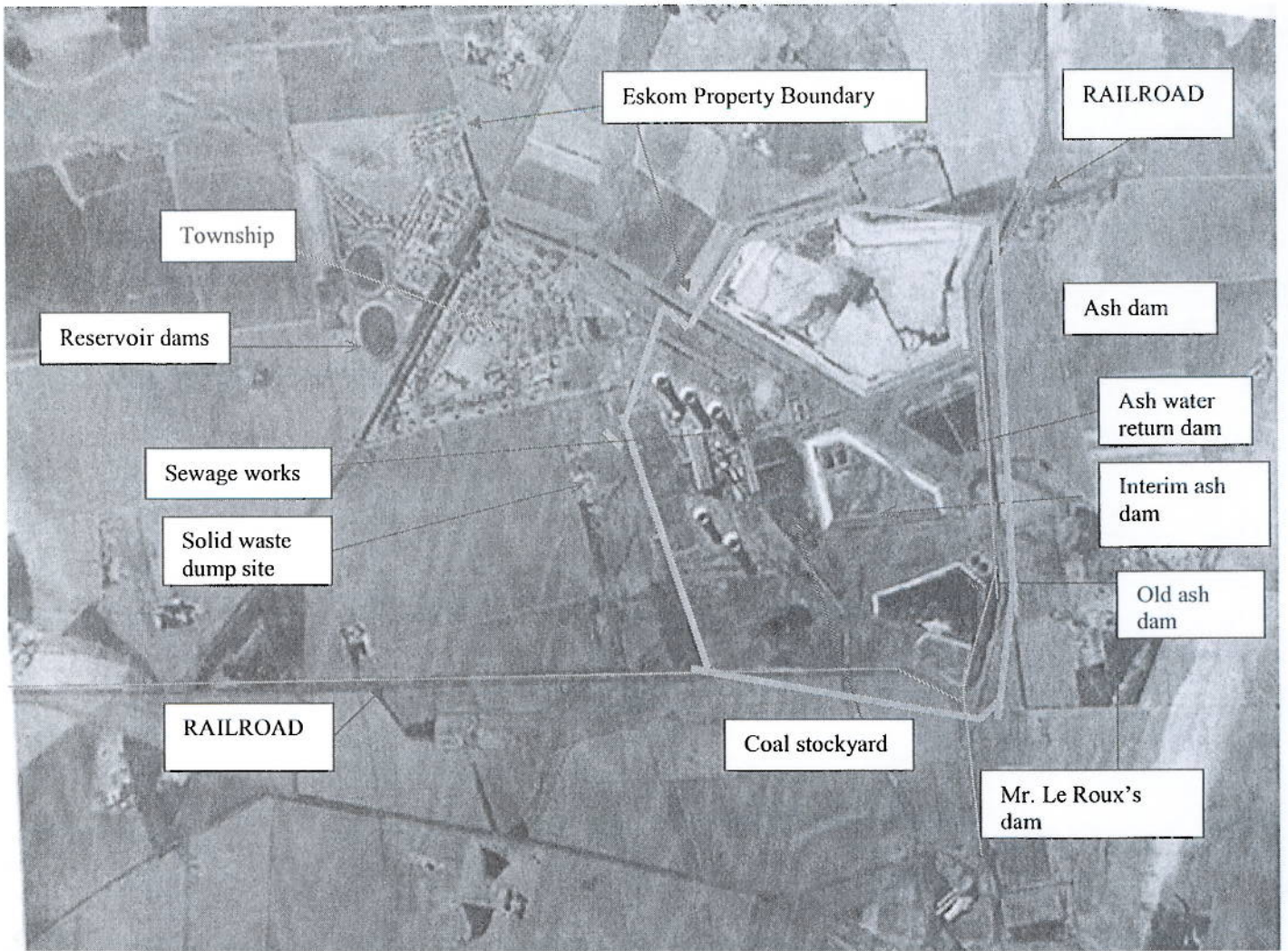


Figure 1: Aerial Photograph of Grootvlei Power Station

## **2. DESCRIPTION OF ACTIVITIES**

### **2.1 Type of industry and products produced:**

Grootvlei Power Station is a coal-fired power station, producing electricity that is fed into the national grid.

### **2.2 Nominal Capacity:**

6 units X 200 MW

### **2.3 Resources:**

#### **a) Coal**

Commissioning coal 2006 76 k tonnes per annum

Planned for 2007 – 505 k tonnes per annum

Planned for 2008 – 1033 k tonnes per annum

Planned for 2009 – 1531 k tonnes per annum

Planned for 2010 – 1584 k tonnes per annum

The coal burn figures are subject to changes in customers electricity demand and undergo frequent revision.

#### **b) Water**

Planned for 2007 – 1 500 Megalitres per month

Planned for 2010 – 8 900 Megalitres per month

### **2.4 Fuel supply:**

The coal supply to the station has not been finalised.

Coal will be transported to the power station by means of trucks or rail. The previously used coal stockpile area may be utilised to store coal. This is however dependant on the transport option selected for the delivery of coal to the power



station. The mode of transport used for coal delivery will determine the location of the coal stockyard.

### 3. DESCRIPTION OF ENVIRONMENT

#### a) *Regional Climate*

Grootvlei Power Station is situated on the Highveld in the western part of Mpumalanga province on the escarpment, at an average height of 1551 m above sea level. The winters are generally dry and cold with regular frost and temperatures varying between -7°C and 23°C.

The summers are mild with most of the rainfall occurring during this season. Temperatures vary between 12° and 32° C.

#### b) *Wind direction*

Data from the Heidelberg weather station shows that Grootvlei Power Station is sited in such a way that for most of the year (291 days) the wind direction is from the power station in a direction that is North West.

#### c) *Rainfall*

Based on information recorded at the Heidelberg weather station, the average annual rainfall for the Heidelberg area is approximately 691 mm. (*Weather Bureau, Pretoria*).

### 4. SOCIAL ISSUES

Aspects, which will be impacted upon by the return to service of Grootvlei Power Station, are:

- Employment (temporary and permanent)
- Skills transfer
- Infrastructure
- Accommodation in surrounding towns (Balfour, Heidelberg, Grootvlei, Dasville)
- Schools in surrounding area
- Water supply and other services

#### 4.1 Employment

Estimated employment:

Activity	Duration	Number employed
Refurbishment of power station	Temporary (over a 6 year period).	400-500
Operation	Permanent	270
Services (cleaning, transport, catering etc)	Permanent	Approximately 250
Mining	Permanent	Will depend on the mine
Road transport as part of fuel supply contract	Temporary	Will depend on contractor

*Table 2: Summary of Employment Activities*

##### a) **Population size**

It is anticipated that the population in the local towns will increase marginally. There is also a possibility that people may come into the areas closer to the power station with the expectation of obtaining employment. This may lead to the development of informal settlements in the area around the power station.

**b) *Unskilled labour***

It is intended that the unskilled labour force for refurbishment will be drawn from residents in the surrounding area of Balfour, Greylingstad and Grootvlei.

**c) *Skilled labour***

Operating staff for the power station can be obtained from other business units, particularly the older power stations, while new staff will also be recruited. A recruitment program will be implemented to fulfil the staffing requirements. Preference for trainees will be given to the local community in accordance with Eskom's recruitment policies. Trainees can serve as role models to the young people in their respective communities.

**d) *Changes to income levels***

Changes in unemployment figures will be evident during the refurbishment phase since it is intended that 400 to 500 people will be employed. Based on the average family size of 5,7 for Mpumalanga it is estimated that 500 jobs will support 28 500 people if an assumption is made that only one person per household earns an income. Households with an income earner will show improved socio-economic conditions.

During the operational phase there will be a discernible decrease in unemployment levels due to the number of permanent staff that will be employed by the power station, service industries and quite possibly at the colliery(ies) supplying coal to the power station. It is envisaged that of these, some will already be in employment at the power station or at some business units within Eskom.

## **4.2 Skills development**

Appropriate skills will be taught to new recruits. Contact with the Energy SETA will be made to ensure that the training given is accredited in order to ensure that the skills development programme is formalised.

## **4.3 Infrastructure**

The infrastructure around the power station is well established. Refurbishment to some of the structures such as roads leading to the power station is required and will be addressed as part of the fuel supply contract in order to accommodate large trucks making frequent use of them. Should it be decided that coal will be railed in as the preferred transport mode during the operational phase, railway lines will also require refurbishment to facilitate the transport of coal from the source to the power station.

The refurbishment and upgrading of roads and railway lines is considered to be one of the major aspects to be addressed to ensure the continued support of the general public for the operation of the power station. The roads that are used to deliver coal to Tutuka and Majuba power stations are being severely damaged and regular critical articles regarding the road transport of coal is published in regional newspapers like the Highvelder.

#### 4.4 Summary

The social impacts are summarised below with an indication of whether the impact of the project is likely to be low, medium, high, positive negative or unknown.

Impact	Extent	Type
Employment		
Permanent	Low	Positive
Temporary	Medium	Positive
Skills development		
-Direct	Low	Positive
-Indirect	Low	Positive
Infrastructure		
-Roads	High	Negative without upgrading but can be made positive
-Railway lines	Medium	
Income levels		
- for skilled staff	Low	Positive
- for unskilled staff	Low	Positive
Population size	Low	Negative. Can be positive for economic development
Immigration		

*Table 3: Summary of social impacts*

**SECTION B****GENERAL OPERATING PRACTICES****1. PROPOSED ORGANISATIONAL STRUCTURE**

Power Station Management will comprise of a Power Station Manager and relevant heads of technical groups. This team represents Eskom Generation on site and is committed to comply with ISO 14001 environmental practices. An Environmental Officer will be employed to manage the practical aspects of ISO14001. During the refurbishment phase a Project Team representing Eskom's Capital Expansion Department (CED) will be on site. Throughout this period the team is governed by the site requirements, including ISO 14001.

In accordance with directive ESKADABD1 related to the implementation of environmental management systems, Eskom has committed itself to becoming ISO 14001 compliant by the end of 2002. ISO 14001 has been implemented at Grootvlei as a non-generating site. This will form the basis for implementing ISO 14001 for a generating power station site. To this end management will ensure that resources are available in order to fulfil responsible environmental management. The power station has an environmental aspects register which will be updated when any new aspect which has an impact on the environment - negative or positive - is identified. This register will be reviewed once a year by management. An Environmental Control Officer will be on-site during the construction phase to ensure compliance to environmental management issues. An Environmental Management Programme will be developed for the management of activities during the construction phase of the project.

## 2. RESPONSIBILITIES

Each technical group head will be responsible and accountable for environmental management within his/her area of responsibility, and will ensure that his/her department has procedures in place that address environmental aspects and adherence to these will minimise environmental impacts.

### 2.1 Power Station Manager

The Power Station Manager will:

- appoint in writing competent persons to manage all environmental management activities
- provide all the resources necessary to sustain environmental management activities
- support activities that will ensure continuous improvement
- communicate with the media regarding sensitive matters
- manage the resources necessary to sustain the environmental management programme
- implement high level indicators to monitor the long term viability of the environment within which the EMP is operated
- provide forums to communicate matters regarding environmental management

### 2.1 Environmental Officer

The Environmental Officer will:

- implement and maintain an SABS ISO 14 001 EMS
- compile and disseminate information regarding improvement programmes to the rest of the power station, head office personnel and the public where applicable
- educate power station personnel regarding their liability and rights with respect to environmental legislation

- make environmental indicators visible through the printing and distribution of posters
- track and control the lodging of any complaints regarding environmental matters
- maintain a register of all known environmental impacts and manage the monitoring thereof

A Safety Health and Environmental Committee will meet every two months. The purpose of the meeting will be to keep management updated on, inter alia, environmental issues and to resolve any environmental concerns. There will also be a quarterly Environmental Committee meeting for specific environmental issues.

### 3. ASPECTS

#### 3.1 Air quality

##### a) *Stack emissions:*

Coal combusted in a power plant to produce heat for electricity generation produces two distinct products, viz. fine particulate matter (FPM) and gaseous emissions. The latter is made up of; inter alia, carbon dioxide, sulphur dioxide, nitrogen oxide and nitrogen dioxide.

Particulate abatement equipment will be installed in order to ensure particulate emissions are maintained, on average for the power station, below 100mg/Sm<sup>3</sup>.

Flue Gas cleaning equipment (FGC)

✓ Grootvlei Power Station will have two types of flue gas cleaning plants. Three (3) of the six (6) units will be fitted with Pulse Jet Fabric Filters (PJFF), depending on the ability to achieve and sustain an average of 100 mg/Sm<sup>3</sup>, and three (3) units will use electrostatic precipitators (ESP) and SO<sub>3</sub> injection for flue gas cleaning. Both types are housed in concrete structures on the outlet side of the boilers.

Dusting is done once a day to remove dust from the hoppers in the form of slurry. This is pumped to the ash dam via the pumps in the ash plant. Some ash is



released into the atmosphere through two stacks, 152,4m in height. Each stack has its own opacity monitor to measure ash density in the flue gases.

Gaseous emissions

SO<sub>x</sub>'s and NO<sub>x</sub>'s are emitted through stacks, 152,4m in height. A monitoring station will be installed to monitor ambient levels of fine particulate matter, sulphur dioxide and nitrogen oxides.

**b) Ash dams**

The active ash dams are situated about 2km north-east of the power station and covers an area of about 200ha. During combustion coarse and fly ash are formed in a ratio of about 16 to 20% coarse ash to 80 to 84% fly ash. Together they are transported to the ash dam as slurry. By selective pumping of slurry, the fly ash and coarse ash are separated and the fly ash is used to build the side walls of the ash dam, while coarse ash gets deposited in the middle area of the dam. The walls have a 1:4 gradient to ensure stability. Rehabilitation of the side walls takes place as they get completed. During operation the surface area, however, stays active and is not rehabilitated.

The water from the slurry gets decanted to ash water return dams, and then pumped back to the station for re-use.

**c) Dust blown from ash dam**

Throughout most of the year, ash dam dust does not pose an environmental risk because Grootvlei Power Station uses a wet ashing system. There are, however, occasions when continuous windy days present a dust problem. It is for this eventuality that a 'rotational ashing' system will be adopted at Grootvlei Power station, i.e. ash will be confined to one section of the ash dam at a time, in order to preserve the rest of the ash dam area and at the same time enable dust suppression irrigation to be carried out in a controlled, manageable area during times of excessive wind. On-going rehabilitation, where possible, will also help to minimise dust blow.

### 3.2 Water

Water is supplied to Grootvlei Power Station from the Vaal dam and is temporarily stored in two terminal raw water reservoirs located to the north west of the power station. The raw water is pre-clarified at Vaal dam prior to pumping to the power station. Water intensive processes used on the power station are listed below. The sludge from the pre-clarification plant is presently disposed of in sludge lagoons where it is allowed to dry. After drying the sludge is removed and disposed of when required. It is envisaged that this operational mode will continue when the power station is in production.

#### a) **Cooling water:**

Most of the raw water consumed in by the power station is used in some form for cooling. The cooling water is split into service water for equipment cooling and for condensing steam in the main turbine condensers. The service water is recovered back into the main cooling water system. The cooling water is circulated through the condensers back to the cooling towers where evaporative cooling of the heated water takes place.

Grootvlei's water management philosophy is based on a quality driven water cascading management system. Higher quality raw water is used for potable, cooling and demineralised water production. As the cooling water deteriorates it is transferred to the ashing system. Water from the dirty drains is diverted to the ashing system as well.

#### b) **Station drains system:**

As part of Grootvlei's commitment to strive towards a Zero Liquid Effluent Discharge (ZLED) policy, the station's water management system will be a closed system.

All industrial effluent and polluted storm water from the station terrace, including the coal stockpile drains area, is pumped to pollution control dams (Seepage dams), situated outside the security fence, south-east of the station. Upstream of

these dams an oil skimmer will remove oil before being pumped to the ashing system via the seepage dams.

Storm water run off will be diverted around dirty areas and the effluent collection system by means of a series of berms and canals to the surrounding area.

**c) *Coal stockpile pollution control dam:***

All the run-off from the stockpile and part of the conveyor belts go to the coal settlement dam situated on the south-eastern side of the stockyard and from there it is pumped to the Seepage dams. This water is recovered to the ash water return dam.

**d) *Ash plant and ash dams:***

The ash water return dams situated towards the east of the power station will, as was the case when the station was generating, be used as an ash water seepage and ash water return (AWR) dam. Ash will be removed from the boiler and the precipitators and pulse jet fabric filter plant into the ash sump from where it will be pumped in a slurry form to the ash dam, about 2km north east of the power station.

Ash settles and the water runs to a penstock from where it is decanted into the ash water return (AWR) dam through a drainage canal situated at the perimeter of the ash dam.

**e) *Sewage plant:***

Grootvlei Power Station currently treats sewage from the station itself and from the adjacent township. The sewage received is treated, chlorinated and sampled before being released into the natural watercourse. This is achieved in a new package activate sludge treatment plant operated as a sequencing batch system. The plant is capable of removing both carbonaceous and nitrogenous compounds and the present requirements of the National Water Act as well as the possible future requirement to remove nitrate from the water can be met. Should the plant be handed over to the local authority Eskom will not be in control of the plant and the plant operation will then not form part of this EMS.

**f) Ground water:**

Ground water monitoring at Grootvlei Power Station was started in 1988 and is ongoing. Modelling is based on data taken from borehole sampling points. These boreholes are strategically placed to intercept any pollution plumes emanating from pollution sources.

The monitoring is an important aspect to track groundwater pollution and to enable Eskom to take the necessary mitigation steps. The frequency of borehole sampling may have to be increased when the power station is recommissioned.

Hodgson and Vermeulen identified that a pollution plume is present in the groundwater at Grootvlei Power Station. In the report it is recommended that demineralisation plant effluent should be handled in a manner that prevents sodium and chloride, although the root anion is sulphate, from diffusing into the ground water. This aspect should be investigated and a practical solution must be sought. Lined evaporation ponds may be used or some type of chemical reclamation using membrane systems may prove to be practical. Various options are still to be investigated. This is expected to add to the recommissioning cost but such an approach may prove to be more cost effective than ground water interception systems that may also be employed.

### **3.3 Land**

**a) Invader plants:**

Invader plants that occur at Grootvlei Power Station include red sesbania (*Sesbania punicea*), pampas grass (*Cortaderia selloana*), syringa (*Melia azedarach*) and pepper trees (*Schinus molle*). An eradication programme is in place and at present after growth is mostly responsible for the presence of these species.

**b) Erosion:**

Erosion occurring on the land under Grootvlei Power Station's control has been and will continue to be identified, rehabilitated and monitored as part of the environmental management plan.

### 3.4 Waste

a) **Non-hazardous waste:**

The previously used domestic disposal site has been transferred to the local authority and is no longer the responsibility of Grootvlei Power Station.

Domestic refuse from the power station and the township is currently, and will continue to be, collected by Dipaliseng Municipality for disposal at the municipal waste disposal site.

b) **Hazardous waste:**

A valid permit exists for the disposal of asbestos (removed from the station during refurbishment activities) on the ash dam. The permit number is 16/2/7/C123//B20/Y1/P492 dated 26 November 2003. The removal of asbestos is scheduled to be completed prior to return to service but the disposal site will have to be monitored and managed even after closure and rehabilitation. This area will have to be marked with permanent markers and be indicated on the title deed.

c) **Scrap metal**

Scrap metal is currently being, and will continue to be sold on a tender basis. Old metal drums and containers are generally returned to a recycling company for recycling.

Used oil will be collected in drums and removed by a suitable contractor.

Any chemicals used for cleaning processes will be disposed of in line with appropriate regulations.

**SECTION C**  
**GENERAL EMP SPECIFICATIONS DURING REFURBISHMENT**

**1. AIR QUALITY**

- 1.1 Excavated sand and areas cleared of vegetation/compacted surfaces/treated areas, shall be managed so as not to cause sand/soil/dust movement (airborne dust).

A dust control plan shall be developed and approved before implementation. Dust control will include but not be limited to:

- restricting vehicle speeds;
  - the prohibition of forming new/additional roads (existing roads are sufficient);
  - applying water to existing gravel haul roads with a spraying truck;
  - rehabilitation to disturbed areas;
  - covering and maintaining appropriate freeboard in trucks transporting loose material;
  - Keeping topsoil piles low; installation of wind breaks.
- 1.2 Fire breaks shall be required to prevent fires spreading from the site as well as fires entering from adjacent land; these shall be constructed in accordance with the Veld and Forest Fires Act
- 1.3 Burning of waste material shall be strictly prohibited.

## 2. WATER

- 2.1 Groundwater and surface water monitoring has been conducted on a six-monthly basis since 1988, and will continue during refurbishment and the return to service of the station. Hodgson and Vermeulen recommend that six-monthly sampling of the monitoring boreholes should be used (Groundwater quality and pollution plume modelling at Grootvlei power Station, November 2002).
- 2.2 All sewage will be treated in the power station's existing sewage treatment plant in accordance with permit requirements. The sewage treatment plant is scheduled to be handed over to Dipaliseng Municipality after a proving period. Grootvlei Power Station will thereafter not have any control over the plant operation and this will then be excluded from the EMP.
- 2.3 In accordance with the requirements of the National Water Act, "all reasonable measures to prevent pollution [of a water resource] from occurring, continuing or recurring will be taken".
- 2.4 All storm water run-offs shall be collected in the Seepage dams.
- 2.5 No vehicle or machinery shall be refuelled on site except at a designated refuelling area.
- 2.6 No oil or lubricant changes or repairs shall be made on site other than at designated workshop areas.
- 2.7 In accordance with the Eskom manual (ESKAMAAD1), relating to the storage and handling of flammable and combustible liquids, fuel, oils and lubricants shall be stored in secure areas which shall be bunded and contain an impervious floor surface to ensure spills do not contaminate the ground or water sources.

- 2.8 Measures shall be taken to prevent and manage the occurrence of oil leaks or fuel spills in accordance with the Eskom directive (ESKADABG8) and standard (ESKASABT0) relating to oil spill clean up and rehabilitation.
- 2.9 Any oil, chemical or fuel spill shall be reported in terms of the requirements of the Eskom standard (ESKASABT0) and applicable legislation.

### 3. NATURAL ENVIRONMENT

No issues were identified that prove a critical flaw for the re commissioning of Grootvlei Power Station. There are no habitats that are will be disturbed that are not replicated elsewhere on the site or on adjoining properties.

A colony of *Bufo rangeri*, a frog with a restricted distribution pattern, was identified during 2000 at the old ash dam, which has been developed as part of a nature reserve. Should any activity be undertaken in this area, the colony will be relocated as suggested by the Mpumalanga Parks Board.

While plants and birds of ecological significance have been seen on the site, however the RTS project will not impact any species negatively. Existing populations of animals will not be impacted by developments.

### 4. WASTE

- 4.1 In accordance with Eskom's Waste Management Policy (ESKPBAAC4) waste management programmes shall be implemented to ensure that the generation of waste, where appropriate is prevented or minimised, and that waste is where possible re-used, recycled, or treated and appropriately disposed of. Facilities shall be made available on site to support the programme.
- 4.2 All hazardous substances at the site shall be adequately stored and accurately identified, recorded and labelled. All hazardous waste substances shall be



disposed of at an appropriate licensed disposal site according to applicable legislative requirements.

- 4.3 All waste removed from the site shall be disposed of at a licensed waste site. Copies of documentary evidence of proper disposal of waste shall be maintained.

## **5. LAND MANAGEMENT**

- 5.1 Prior to commencement of any excavation, into the natural soil profile, all topsoil (upper 300mm) shall be removed and stockpiled on a designated area. During back-filling, the sub-soil shall be replaced first, followed by the replacement of the topsoil.

- 5.2 Both structural and non-structural (vegetation) erosion control measures shall be designed and implemented to prevent or minimise the potential for soil erosion.

## **6. GENERAL**

- 6.1 All services (water, electricity) shall be metered and monitored.
- 6.2 An Eskom appointed Environmental Control Officer shall monitor activities against the EMP and report on performance to Eskom Generation Environmental Management.
- 6.3 Environmental induction training shall be given to all staff coming onto site.
- 6.4 All construction/refurbishment/contract staff shall attend an induction course.
- 6.5 All construction site buildings shall be designed and erected to ensure that they can be dismantled and removed after completion of the refurbishment activities.
- 6.6 Fires and open flames shall only be permitted in demarcated areas.

- 6.7 A disaster response (fire, chemical, medical etc.) shall be developed and implemented.
- 6.8 The Environmental Control Officer shall have access to the refurbishment areas at all times to monitor compliance to specific EMP requirements.
- 6.9 Herbicide usage shall adhere to legal requirements, and only be applied in accordance with the Eskom policy (ESKPBAAD4) and standard (ESKASAAL0) relating to the use of herbicides.
- 6.10 The condition of gates, fences and locks shall be regularly monitored to ensure that they are secure (i.e. prevent animals getting in as well as prevent access to the site by unauthorized personnel) and maintained in a good state. Repairs to damaged gates and fences shall be performed expeditiously. Gates shall be kept closed at all times.
- 6.11 Access roads and site ground shall be monitored for deterioration and possible erosion. Soil erosion shall be prevented or minimized at all times. Pro-active measures shall be taken to prevent erosion and any eroded areas will be rehabilitated.
- 6.12 Invasive plants shall be controlled in accordance with relevant legislation.
- 6.13 All animal fatalities due to site work shall be identified and appropriate action shall be implemented to minimise or eliminate the problem. Wildlife interactions shall be reported, recorded and investigated in compliance with Grootvlei Power Station's site procedure and, after action is implemented to solve the problem, it shall be followed up to assess the effectiveness of the remedial procedures taken.
- 6.14 Metal surface preparation, including solvent washing, acid pickling and blast cleaning and spray painting shall be performed in demarcated areas with adequate precautions to prevent spillage of solvents or acids and to prevent escape of dust from the area. Emergency plans to manage accidental spillage shall be developed.

- 6.15 A noise control plan shall be developed and implemented. This should include, amongst others: conformance to the South African Bureau of Standards' recommended code of practice, SABS Code 0103:1983

**SECTION D**  
**GENERAL EMP SPECIFICATIONS DURING OPERATION**

**1. AIR QUALITY**

- 1.1 Application for a license in terms of the Atmospheric Pollution Prevention Act (Act 45 of 1965) is being made to DEAT Chief Air Pollution Control Officer (CAPCO).
- 1.2 On the ash dam, effective dust suppression will be achieved by 'rotation ashing' and by irrigating the ashed areas.
- 1.3 To reduce the volumes of fine particulate matter emitted, particulate abatement equipment will be installed to ensure particulate emissions are maintained, on average for the power station, below 100mg/Sm<sup>3</sup>. This equipment will be maintained through regular and preventative maintenance. Regular liaison with DEAT Chief Air Pollution Control Officer (CAPCO) by reporting on emission levels will be practised.
- 1.4 A temporary ambient air quality monitoring site will be established until all 6 units have been returned to service.

**2. WATER**

- 2.1 Application for a registered water user, as well as application for a water license in terms of the National Water Act (Act 36 of 1998) has been made. A registration certificate (number 20010382 dated 3 December 2003) for water usage has been issued to Grootvlei Power Station by the Department of Water Affairs and Forestry.
- 2.2 All industrial effluent and polluted storm water from the station terrace, including the coal stockpile drains area, will be reticulated to the Seepage dams for eventual reuse in the ashing system.

- 2.3 Ash lines on Eskom property will be upgraded during the refurbishment phase and maintained by prescribed methods and by operator training.
- 2.4 Level indicators shall be installed at all dams and these will be monitored on a regular basis, especially after rains.
- 2.5 Until hand-over of the sewage plant has been negotiated with the Dipsaliseng Municipality, sewage received shall be treated, chlorinated and sampled by the power station.

### **3. WASTE**

- 3.1 A waste management programme shall be implemented to minimise, manage and control all waste.
- 3.2 Sufficient containers shall be situated at identified points for the collection of domestic/office waste, which will be disposed of at a municipal dump site.
- 3.3 Separate containers for the collection of medical waste shall be situated at identified points and shall be disposed of by incineration at an appropriate facility.
- 3.4 Adequate signage shall be posted at identified points on site to minimise the incidence of illegal dumping.
- 3.5 Fluorescent tubes and other hazardous waste items shall be maintained in a safe storage area for disposal by an approved contractor to a hazardous waste site.
- 3.6 Ensuring and maintaining the integrity of transformers, oil traps, fuel oil tanks and floor surfaces shall prevent pollution of groundwater by oil or grease. This shall be achieved by physical inspection and trained personnel.

#### **4. LAND MANAGEMENT**

- 4.1 Firebreaks shall be constructed for the prevention and spread of fires. Emergency Preparedness Procedures shall be adhered to in the event of a fire.
- 4.2 Herbicide usage shall be recorded and monitored in order to manage and control the damage to vegetation and associated areas.
- 4.3 Remedial action shall be taken in the event of soil pollution.
- 4.4 Erosion control measures shall be designed and implemented to prevent or minimise the potential for soil erosion.
- 4.5 A programme for the removal of invader species shall be implemented.