S24G APPLICATION FOR RECTIFICATION

THE UNLAWFUL COMMENCEMENT OF ACTIVITIES LISTED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AS AMENDED, AND IN TERMS OF SECTION 19 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT 59 OF 2008

DRAFT ENVIRONMENTAL IMPACT REPORT

CONSTRUCTION AND OPERATION OF INFRASTRUCTURE AND FACILITIES FOR THE RETURN TO SERVICE OF KOMATI POWER STATION, MPUMALANGA PROVINCE

Date: December 2012

Environmental Impact Evaluation Directorate Ref: 14/12/16/3/2/40

Waste Authorisation and Disposal Management Directorate Ref: 12/9/11/L995/6/24G

Tel : +27(0) 10.0600.355 Fax : +27 0862935676
Bateleur Building, Ground Floor, Hertford Office Park, 90 Bekker Road,
Vorna Valley, Midrand, 1685. PO Box 2437, Halfway House, 1685

A MEMBER OF THE SEBATA GROUP OF COMPANIES

Prepared for:
Sebata Institute

Tel: 010.0600.355
Fax: (011) 206 5922
E-Mail: shaelharris@sebatainstitute.com

Prepared by:
ILISO Consulting (Pty) Ltd

Tel: (012) 685 0900
Fax: (012) 665 1886
E-Mail: Nadine@iliso.com

On behalf of:
Eskom Holdings SOC Ltd

Tel: (013) 295 9226
Fax: (013) 295 9230
E-Mail: Christo.Basson@eskom.co.za

REV	DATE
01	2012-12-14

EXECUTIVE SUMMARY

Komati Power Station is located in the Steve Tshwete Municipality, along the R35, between Middelburg to the north (40 km) and Bethal to the south (40 km), on approximately 2 100 ha of land on the Farm Komati Power Station 56 IS.

The power station was designed and commissioned in the early 1960's, with an installed capacity of 1000 MW. It was later mothballed in 1990. Eskom Holdings SOC Ltd. (Eskom) obtained a Record of Decision (RoD) Exemption (from EIA process) for the Return to Service (RTS) of the Komati Power Station on the 13th of December 2005. This RoD was issued for the return to service of the Komati Power Station "as is" (i.e. as the station was before mothballing). The RoD was subject to the condition that, should any listed activity be triggered, a separate application be submitted.

The return to service of Komati Power Station involved inter alia the upgrading and extension of certain facilities and infrastructure, as well as the installation of new facilities in order to bring the station into compliance with Eskom's Zero Liquid Effluent Discharge Philosophy (ZLED). Some of the activities initiated by Eskom as part of the RTS of Komati Power Station are deemed to not have been duly authorised and are therefore the subject of this S24G rectification application, which allows for retrospective authorisation of unlawful activities.

The rectification application concerns the following unlawful activities listed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA):

- *Construction of a desalination plant (activity commenced on 8 August 2008);*
- *Construction of third recovery dam (activity commenced on 26 March 2007);*
- *Upgrading and extension of a haul road (activity commenced on 16 April 2007); and*
- *Upgrading of coal stockpile yard (activity commenced May 2007).*

In addition, the following unlawful activity listed in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEMWA) is applied for:

- *Construction of a portable Reverse Osmosis (RO) plant (activity commenced on 4 June 2010).*

This Environmental Impact Report describes the listed activities unlawfully commenced with, including an assessment of the impacts of these activities. Recommendations regarding the management and mitigation of impacts are given in the draft Environmental Management Programme (EMP), which is included as Appendix D to this report. This report is intended to provide the necessary information to the relevant authorities in order to determine the appropriate action to be taken regarding the operation of these activities.

This report will be made available to the public for comment and any comments and objections received from interested and affected parties will be considered in the assessment and submitted to the competent authorities.

The following environmental issues and potential impacts were investigated:

- ***Air Quality***
  Construction activities for the various listed activities are likely to have generated dust and gas emissions due to the clearing of groundcover, tipping of material to storage piles, levelling of areas, wind erosion from storage piles, vehicle and construction equipment activity, and tailpipe emissions from vehicles and construction equipment such as graders, scrapers and dozers.
  Impacts from the coal stockyard and haul road during operation are in the form of dust related to coal storage (i.e. wind erosion), handling and transfer of coal (especially tipping of coal), dust caused by transport vehicles travelling on the road, as well as vehicle exhaust emissions from truck transport.

- ***Wetland and aquatic ecology***
  Impact on wetlands and aquatic ecology include the encroachment by power station activities; seepage of dirty water; vehicles entering sensitive areas; ineffective rehabilitation; loss of ecological services; impacts due to sedimentation and erosion; impact on overall faunal biodiversity due to impact on habitat and migratory corridors; and impacts on aquatic community sensitivity and diversity.

- ***Water Quality***
  Impacts on the quality of surface water may have occurred during the construction phases of the various activities due to clearing of vegetation, contamination of stormwater, spillages of hydrocarbons/dangerous goods and improper disposal of general waste.
  During operation negative impacts on water quality can occur due to spills and leaks during the transport, handling and storage of hazardous substances, infiltration of dirty water from the coal stockyard may cause surface and groundwater contamination. Operation of the desalination plant and RO plant may cause groundwater contamination through the discharge of brine in the ash water return dam.

- ***Waste management and hazardous substances***
  The operation of the various activities does not result in any solid waste. Operation of the desalination plant and portable RO plant however generates brine which is discharged on the ash water return dam.
  All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
  Spills and leaks can occur during the storage and handling of hazardous substances required for the operation of the desalination plant and portable RO plant.

- ***Health and safety***
  Operations at the power station present potential risks for the health and safety of workers on site. Eskom has developed and is implementing training programmes and procedures to prevent and manage these risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies. The training programmes and operational procedures also cover the health and safety aspects related to emergency situations.

- ***Traffic***
  With the haul road and coal stockyard upgrades, there are large quantities of coal transported to the station by trucks/road (approximately 556 trucks/day with 27 ton load capacity each, 1 truck every 2-3 min). As a result, traffic volumes have increased on the road network surrounding the power station (especially R35), which is likely to have caused negative impacts on traffic patterns, as well as increased road maintenance requirements.
  The additional traffic also causes air pollution (dust and gas emissions) and may negatively impact on the safety of other road users.

- ***Noise***
  Sources of noise include the operation of the desalination plant and the portable RO plant, operations at the coal stockyard, and trucks travelling to and from the power station.
  The main noise receptor is Komati village, which is situated relatively far from the above-mentioned sources of noise, and is not expected to be adversely impacted by the activities.

The main findings of the environmental impact assessment are as follows:

- *Aside from traffic impacts, related to transport of materials and equipment, which were rated as medium, all other construction related impacts were rated as medium-low or low. This is largely due to the fact that Komati Power Station has procedures and requirements in place, which are implemented in terms of the Environmental Management System (EMS), relevant Environmental Management Programmes (EMPs), as well as Eskom's own policies regarding safety, health and environmental issues. It is assumed that the implementation of these procedures and requirements resulted in significant impacts being avoided, or mitigated.*

- *Construction for all activities is completed. The most significant impacts associated with the operation of the listed activities applied for relate to air quality, water quality and wetland and aquatic ecology.*

- *Air quality impacts are mainly associated with the supply of coal by truck and coal handling operations at the coal stockyard. Particulate matter emissions are considered to be the main impact in that regard. Dust is regarded as a nuisance for neighbouring communities and has a negative impact on fauna and flora as well. Dust emissions are*

high and exceed the daily limits set by the standard laid out in the National Environment Management: Air Quality Act. Although the annual emissions are below the limits set by this standard, it is recommended that the existing Fugitive Emissions Management Plan be reinforced to include measures recommended by the air quality specialist.

- *There is evidence of surface and groundwater contamination in the areas around the coal stockyard and the 3rd recovery dam, although the source of the contamination is uncertain. According to the monitoring data, sulphate and manganese are the main pollutants in those areas. Impacts were rated as medium. Overall, a decreasing trend was identified for sulphate and manganese concentrations over the period, suggesting that mitigation of impacts and management of storm water and effluent at the power station has improved.*
  Results from the surface water quality sampling conducted by the wetland and aquatic ecology specialist however indicated that EC was very high and pH significantly acidic downstream of the coal stockyard. These impacts can potentially be attributable to runoff from the coal stockyard.
  Based on results from the water quality monitoring, the discharge of brine on the ash water return dam has not caused any negative impacts on groundwater.

- *The construction of the haul road and coal stockyard within the 32 m wetland buffer zone as well as seepage from power station facilities have had a negative impact on wetlands and the aquatic ecology of the system. Despite the water management measures in place (e.g. separation of clean and dirty water, lining of dams and coal stockyard), the toxicological data indicates that the activities adjacent to the wetland system are having a severe impact on the water quality within the system and are highly likely to impact on the aquatic ecology of the system. Implementation of additional mitigation measures is therefore recommended. A list of such measures is included in the EMP.*

- *The activities at Komati have also resulted in traffic impacts. Although the exact impact on the level of service and the condition of roads in the region, in particular the R35, has not been quantified, SANRAL has indicated that the R35 road was being repaired and maintained on an ongoing basis and that both the condition and level of service of the R35 were good.*

- *The main sources of noise associated with the activities are related to coal stockyard operations and traffic on the haul road. Due to the absence of sensitive receptors in the vicinity of these operations, and existing mitigation, these impacts were rated as low.*

- *Impacts related to waste management, hazardous substances, and health and safety were not identified as significant impacts. This suggests that the waste management plan and health and safety procedures and training implemented at the power station are effective and sufficient to avoid and mitigate impacts.*

The activities applied for will result in positive impacts in the case of the water treatment facilities (desalination plant and portable RO plant): these facilities will greatly improve water and effluent management at the power station, and they are critical in bringing Komati in compliance with Eskom's ZLED requirements.

Besides improving water and effluent management, the main benefit of the activities is to maintain Komati Power Station operational. The power supply to the country is particularly stretched and Komati is a vital link in the power supply to the national grid. In order to assist the grid, Komati Power Station needs to run. All the activities subject to this rectification application are necessary to maintain the power station fully operational.

Should the activities not be allowed to continue, this will have a negative impact on the electrical grid. To compensate for electricity inadequacy while ensuring there is no load shedding, Eskom might have to run diesel and gas turbines, which will lead to high input costs.

It is therefore recommended that the activities applied for in this rectification application be granted environmental authorisation, subject to the implementation of additional mitigation measures as recommended in the draft EMP.

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DRAFT ENVIRONMENTAL IMPACT REPORT

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LIST OF ABBREVIATIONS

AWR	Ash Water Return
CCW	Condenser Cooling Water
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EA	Environmental Assessment
EIR	Environmental Impact Report
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EMS	Environmental Management System
I&AP	Interested and Affected Parties
MEC	Member of the Executive Council
MPHRA	Mpumalanga Provincial Heritage Resources Authority
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
OREWA	Olifants River Ecological Water Requirements Assessment (
PES	Present Ecological State
PPP	Public Participation Process
RO	Reverse Osmosis
RTS	Return to Service
RoD	Record of Decision
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resources Agency
WMA	Water Management Area
URS	User Requirement Specifications
WTP	Water Treatment Plant
WUL	Water Use Licence
ZLED	Zero Liquid Effluent Discharge

1. INTRODUCTION

1.1 BACKGROUND TO THE PROJECT

Komati Power Station was designed and commissioned in the early 1960's, with an installed capacity of 1000 MW. It was later mothballed in 1990. The demand for electricity increased significantly in recent years, necessitating the Return to Service (RTS) of the 9 units at Komati. Since the previous operation of the station, the laws governing water conservation and usage, the natural environment and waste management have become more rigorous.

As it is common with major projects, there are multiple changes to the original design and specification due to changes in technology, legislation, and strategic direction of an organisation such as Eskom. These transitions led to changes in the technology utilised to generate electricity at Komati Power Station.

The return to service of Komati Power Station involved *inter alia* the upgrading and extension of certain facilities and infrastructure, as well as the installation of new facilities in order to bring the station into compliance with Eskom's Zero Liquid Effluent Discharge Policy (ZLED).

Eskom Holdings SOC Ltd. (Eskom) obtained a Record of Decision (RoD) Exemption (from EIA process) for the Return to Service of the Komati Power Station on the 13th of December 2005. This RoD was issued for the return to service of the Komati Power Station "as is". It should be noted that this RoD was subject to the condition that, should any listed activity be triggered, a separate application be submitted. Some of the activities initiated by Eskom as part of the RTS of Komati Power Station were not duly authorised and are therefore the subject of this S24G rectification application, which allows for retrospective authorisation of unlawful activities.

Sebata Institute submitted an application to the Department of Environmental Affairs (DEA) on behalf of Eskom for the rectification of the unlawful commencement of listed activities. After reviewing the application, the DEA requested that an Environmental Assessment (EA) be conducted for the activities concerned, taking into account all the applicable Departmental Guidelines throughout the application process (see DEA requirements letter in **Appendix A**).

The rectification application concerns the following unlawful activities listed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA):

- Construction of a desalination plant (activity commenced on 8 August 2008);
- Construction of third recovery dam (activity commenced on 26 March 2007);
- Upgrading and extension of a haul road (activity commenced on 16 April 2007); and

- Upgrading of coal stockpile yard (activity commenced May 2007).

In addition, the following unlawful activity listed in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEMWA) is applied for:

- Construction of a Portable Reverse Osmosis (RO) Plant (activity commenced on 4 June 2010).

1.2 LOCATION OF STUDY AREA AND PROPERTY DESCRIPTION

Komati Power Station is located in the Steve Tshwete Municipality, along the R35, between Middelburg to the north (40 km) and Bethal to the south (40 km), on approximately 2 100 ha of land on the Farm Komati Power Station 56 IS. (**Figures 1** to **3**).

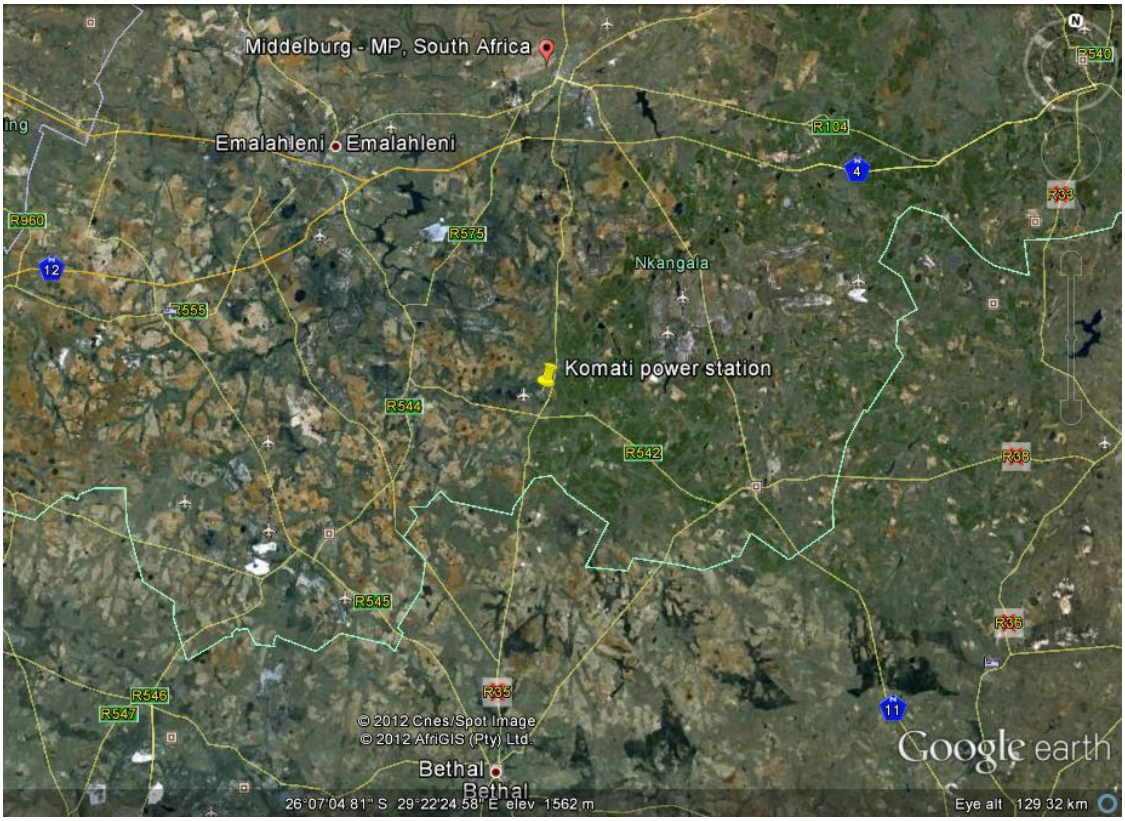


Figure 1: Komati Power Station - Regional Setting

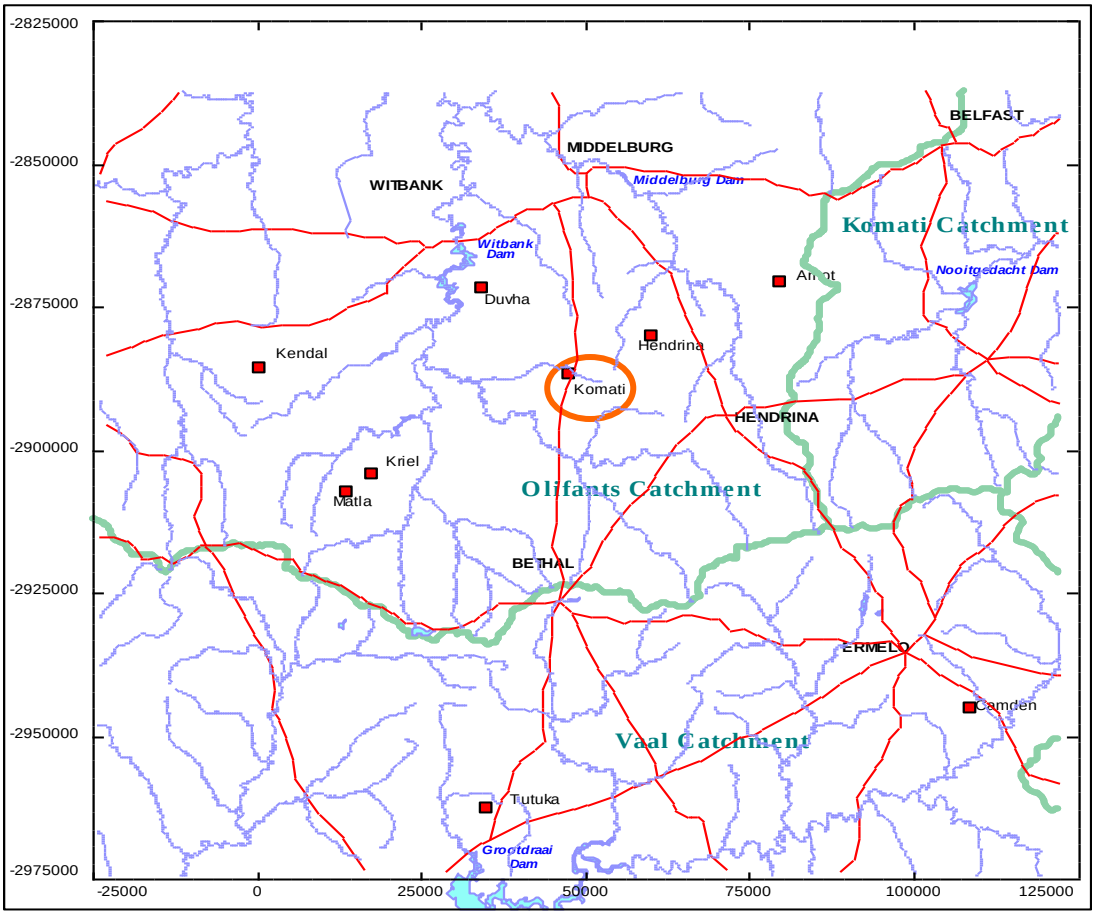


Figure 2: Location of Komati Power Station in relation to other Eskom power stations in the region

Figure 3: Locality Plan

1.3 PURPOSE OF THE STUDY

This study fulfils the requirements of the DEA in respect of the rectification application under consideration (**Appendix A**) and has been undertaken in compliance with NEMA and EIA Regulations, 2010.

The EIA regulations, in accordance with NEMA, identify activities that may result in substantial impacts to the environment. The regulations require that an environmental impact assessment process be undertaken for these activities and a report be submitted to the relevant authority for consideration. Commencement with any of the listed activities prior to obtaining authorisation from the relevant authority is prohibited by these regulations and constitutes an offence.

Government Notice 718, in accordance with NEMWA, lists waste management activities that have, or are likely to have a detrimental effect on the environment. No person may commence, undertake or conduct a waste management activity listed in this Schedule unless a licence is issued in respect of that activity.

This study covers the assessment of four (4) activities listed in terms of NEMA and one (1) activity listed in terms of NEMWA.

1.4 PURPOSE OF THIS REPORT

This Environmental Impact Report describes the listed activities unlawfully commenced with, including an assessment of the impacts of these activities. It is intended to provide the necessary information to the relevant authorities in order to determine the appropriate administrative fine(s) and action to be taken regarding the operation of these activities.

This report will be submitted to the Department of Environmental Affairs' Environmental Impact Evaluation Directorate and Waste Authorisation and Disposal Management Directorate, who will consider the authorisation of activities listed in terms of NEMA and NEMWA respectively.

1.5 STRUCTURE OF THIS REPORT

Chapter 1 – Introduction
Chapter 2 – Legislation and guidelines considered
Chapter 3 – Details and Expertise of the Environmental Assessment Practitioner
Chapter 4 – Approach to the Environmental Assessment process
Chapter 5 – Description of listed activities applied for
Chapter 6 – Alternatives
Chapter 7 – Description of the affected environment
Chapter 8 – Need and desirability of the activities

Chapter 9 – Public Participation process
Chapter 10 – Specialist studies' findings and recommendations
Chapter 11 – Description of environmental impacts identified
Chapter 12 – Assessment of Environmental Impacts
Chapter 13 – Environmental Management Programme
Chapter 14 – Environmental Impact Statement
Chapter 15 – Conclusions and Recommendations.

2. LEGISLATION AND GUIDELINES CONSIDERED

2.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, AS AMENDED

The National Environmental Management Act (107 of 1998) (NEMA) makes provision for the authorisation of certain controlled activities by a competent authority. The EIA Regulations were first promulgated in terms of Section 24(5) of NEMA on 21 April 2006 in Government Notice R 385, and were later replaced with the EIA Regulations, 2010. The regulations define the requirements in terms of Chapter 5 of NEMA for the submission, processing, consideration and decision of applications for environmental authorisation of listed activities. Two lists, defining activities that require either basic assessment or scoping and Environmental Impact Assessment in terms of Sections 24 and 24D of NEMA were published in 2006 in Government Notice R 386 and R 387 respectively. These were replaced in 2010 by Government Notice R 544, 545 and 546. Any activities that were captured under either of these lists required environmental authorisation from the competent authority.

The following activities in terms of NEMA are concerned (NEMA EIA Contraventions between 03 July 2006 and before end of day 01 August 2010):

- **Upgrading and extension of the haul road (commenced on 16 April 2007)**
  *Government Notice No. R386 Activity No **1(m)** - The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including -*
  (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.

  *Government Notice No. R386 Activity No **15** - The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.*

- **Upgrading and expansion of coal stockpile yard (commenced in May 2007)**
  *Government Notice No. R386 Activity No **1(m)** - The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including -*
  (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.

  *Government Notice No. R386 Activity No **1(k)** - The bulk transportation of sewage and water, including storm water, in pipelines with*
  (i) an internal diameter of 0,36 metres or more; or

(ii) a peak throughput of 120 litres per second or more.

- **Construction of the 3rd recovery dam (commenced on 26 March 2007)**
  *Government Notice No. R386 Activity No **1(n)** - The construction of facilities or infrastructure, including associated structures or infrastructure, for the off-stream storage of water, including dams and reservoirs, with a capacity of 50 000 cubic metres or more.*

- **Construction of the desalination plant (commenced on 8 August 2008)**
  *Government Notice No. R387 Activity No **1(p)** - The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more.*

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT

The following activity listed in terms of the National Environmental Management: Waste Act (Act 59 of 2008) is concerned (NEMWA contraventions after 01 July 2009 to date):

- **Construction of the portable reverse osmosis (RO) plant (commenced on 4 June 2010)**
  *Government Notice No. 718 Waste Management Activity No **4(7)** - The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more.*

2.3 NATIONAL WATER ACT

The National Water Act (Act 36 of 1998) (NWA) recognises that the entire ecosystem and not just the water itself in any given water resource constitutes the resource and as such needs to be conserved. No activity may therefore take place within a watercourse unless it is authorised by DWA. Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from DWA in terms of Section 21 (c) and (i).

The third recovery dam is an activity that requires a Water Use Licence (WUL) in terms of Section 21(g) of the National Water Act (No 36 of 1998). An Integrated Water Use Licence Application (IWULA) for water uses listed in Section 21 of the National Water Act (No 36 of 1998) was compiled in 2007 for Komati Power Station (covering the 3rd recovery dam) and submitted to the Department of Water Affairs (DWA) for approval. No final WUL for this activity has been issued by the Department of Water Affairs to date.

2.4 NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act (Act 25 of 1999) provides for the protection of heritage resources including all archaeological and palaeontological sites and meteorites. Section 38 of the Act defines the categories of development for which the responsible heritage resources authority must be notified. These include 'the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length' (Section 38 (a)).

A phase 1 heritage impact assessment was conducted for the study area in 2007. The Mpumalanga Provincial Heritage Resources Authority (MPHRA) has been identified as a stakeholder during the Public Participation Process and has been notified of this application.

2.5 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act (Act 10 of 2004) provides for the Minister or MEC to list species and ecosystems which are threatened and in need of protection as well as to identify threatening processes within these ecosystems. No protected species have been identified on site. Should any protected species be identified, appropriate mitigation must be implemented or permits obtained.

2.6 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT

The National Environmental Management: Air Quality Act (Act 39 of 2004) makes provision for the setting and formulation of National ambient air quality standards for substances or mixtures of substances which present a threat to health, well-being or the environment. The National ambient air quality standards prescribe the allowable ambient concentrations of pollutants which are not to be exceeded during a specified time period in a defined area. If the air quality standards are exceeded, the ambient air quality deteriorates and the potential for health effects increases.

Section 22 of the National Environmental Management: Air Quality Act (39 of 2004) states the following regarding Atmospheric Emission Licenses:
22. No person may without a provisional atmospheric emission license or an atmospheric license conduct an activity:
(a) Listed in the National List anywhere in the Republic; or
(b) Listed on the list applicable in a province anywhere in that province;

Listed Activities schedule for Section 21 Air Quality Act (31 March 2010) as published on Government Notice 33064 include:

- *Category 1. Combustion Installations*
  Number 1.1: Solid Fuels (excluding biomass) combustion installations used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50MW input per unit, based on the lower calorific value of the fuel used.

- *Category 5. Mineral Processing Industry*
  Number 5.1: Storage and handling of ore and coal not situated on the premises of a mine or works as defined in the Mines Health and Safety Act 29/1996. Locations designed to hold more than 100 000 tons.

Both of these activities are covered under the Komati Power Station's Registration Certificate issued in terms of the Atmospheric Pollution Prevention Act (45 of 1965), which is valid until 31 March 2014.

3. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

This Environmental Assessment Report was compiled by Nadine Duncan and Lea September, with input from a team of specialists, and reviewed by Deon Esterhuizen as the lead Environmental Assessment Practitioner (EAP).

Deon Esterhuizen has a MSc in Environmental Management with 20 years of experience in water related projects, which include water resource management, water quality management, water use registration and licensing of water users, including project management of multi-disciplinary studies. He also has extensive experience in a wide-range of environmentally related projects, processes and applications for private, commercial and industrial clients, in addition to local, provincial and national government departments.

Nadine Duncan has an Honours Degree in Geography with 6 years of experience in Planning and Environmental Impact Assessment related projects, which include completion of Environmental Impact Assessments in support of the issuing of Record of Decisions, project management, and implementation.

Lea September is an Environmental Assessment Practitioner with Masters degrees in Environmental Management and Political Science. She has 4 years experience in impact assessment and environmental management and has been responsible for drafting impact assessment reports and Environmental Management Programmes, and conducting public participation processes, as well as high level environmental screenings for a variety of projects in the energy, water, transport and industrial sectors.

4. APPROACH TO THE ENVIRONMENTAL ASSESSMENT PROCESS

4.1 OBJECTIVES

The main objectives of the environmental impact assessment are to:

- Assess the significance of the environmental issues and impacts focusing on key impacts;
- Recommend appropriate measures to mitigate negative impacts and enhance the benefits and include them in the EMP;
- Conduct a public participation process that provides opportunities for all interested and affected parties (I&APs) to be involved and provide input into the environmental assessment process.

4.2 ASSESSMENT METHODOLOGY

A description of the nature of the impact, any specific legal requirements and the stage (construction or operation) is given. Impacts are considered to be the same during construction and decommissioning. The significance of the potential impacts has been considered before and after identified mitigation is implemented.

The following criteria was used to evaluate significance:

- **Nature**: The nature of the impact will be classified as positive or negative, and direct or indirect.

- **Extent and location**: Magnitude of the impact, classified as:
  - **Local**: the impacted area is only at the site – the actual extent of the activity
  - **Regional**: the impacted area extends to the surrounding, immediate and neighbouring properties.
  - **National**: the impact can be considered to be of national importance.

- **Duration**: This measures the lifetime of the impact, and is classified as:
  - **Short term**: the impact will be for 0 – 3 years, or only last for the period of construction.
  - **Medium term**: three to ten years.
  - **Long term**: longer than 10 years or the impact will continue for the entire operational lifetime of the project.
  - **Permanent**: this applies to the impact that will remain after the operational lifetime of the project.

- **Intensity**: This is the degree to which the project affects or changes the environment, and is classified as:
  - **Low**: the change is slight and often not noticeable, and the natural functioning of the environment is not affected.

  - **Medium**: The environment is remarkably altered, but still functions in a modified way.
  - **High**: Functioning of the affected environment is disturbed and can cease.

- **Probability**: This is the likelihood or the chances that the impact will occur, and is classified as:
  - **Low**: during the normal operation of the project, no impacts are expected.
  - **Medium**: the impact is likely to occur if extra care is not taken to mitigate them.
  - **High**: the environment will be affected irrespectively; in some cases such impact can be reduced.

- **Confidence**: This is the level of knowledge/information that the environmental impact practitioner or a specialist had in his/her judgement, and is rated as:
  - **Low**: the judgement is based on intuition and not on knowledge or information.
  - **Medium**: common sense and general knowledge informs the decision.
  - **High**: Scientific and/or proven information has been used to give such a judgment.

- **Significance**: Based on the above criteria the significance of issues will be determined. This is the importance of the impact in terms of physical extent and time scale, and is rated as:
  - **Low**: the impacts are less important.
  - **Medium**: the impacts are important and require attention; mitigation is required to reduce the negative impacts.
  - **High**: the impacts are of great importance. Mitigation is therefore crucial.

- **Cumulative Impacts**: The possible cumulative impacts will also be considered.

- **Mitigation**: Mitigation for significant issues is incorporated into the EMP.

4.3 ASSUMPTIONS AND LIMITATIONS

The assessment of environmental impacts has taken place after the activities applied for have been completed. As a result certain assumptions have been made and some limitations apply to this assessment. These are described below:

- The assessment of environmental impacts was based on information available at the time of the assessment.
- Actual construction related impacts could not be measured and/or monitored since the construction phase of the activities was complete. In addition, limited baseline data exists on environmental parameters at the site (e.g. air quality, water quality etc.) prior to the power station being re-commissioned, or prior to listed activities being undertaken. The assessment of construction related impacts thus relies on assumptions on the likelihood, severity, extent and

duration of impacts. These assumptions were based on the procedures and requirements currently in place at Komati Power Station, which are implemented in terms of the Environmental Management System (EMS) in place, relevant Environmental Management Programmes (EMPs), as well as Eskom's own policies regarding safety, health and environmental issues. This was further complemented by the EAP's expert knowledge of impacts of similar types of activities.

- Impacts assessed in this study may not be solely attributable to the listed activities which are the subject of this application. A combination of historic impacts and cumulative impacts of other activities is likely in certain instances. It is not possible to strictly isolate the impacts of the listed activities based on the available data.
- A conservative approach was adopted for the assessment of water quality impacts as important discrepancies existed between the water quality monitoring results provided by the Komati Power Station and the sampling results obtained by the wetland and aquatic specialist, which did not allow for a conclusive assessment of impacts.
- The level of information was insufficient to accurately rate traffic related impacts and the assessment was based on available information. A traffic impact assessment would be necessary to quantify these impacts more accurately

5. LISTED ACTIVITIES APPLIED FOR

5.1 NEMA LISTED ACTIVITIES

5.1.1 Upgrading and extension of the haul road

All coal supply at Komati is delivered via truck. There was no haul road for coal trucks to access the coal stockpile yard before the return to service of Komati Power Station. In order to accommodate the traffic generated by the return to service of Komati Power Station, the existing access road from the R35 (approx. 640 m) was upgraded in order to handle the estimated 556 trucks per day with a load capacity of 27 ton each (Eskom, 2006a and 2006b). It was also extended by approximately 1 110 m to the coal stockpile yard (Refer to **Figure 9a**). The haul road is paved, in order to reduce dust pollution, as well as maintenance costs.

Construction of the haul road commenced on 16 April 2007 and was completed on 7 August 2007.

5.1.2 Upgrading and expansion of the coal stockpile yard

The Komati Power Station's coal stockpile yard is situated within the power station boundaries and covers an area of approximately 5.36 ha. The coal stockyard is used as bulk storage and is a live stockpile[1].

Komati faced coal handling problems due to the large variances in coal quality supplied over short periods of time, which caused blockages and load losses. These variances in quality are inherently associated with coal supplied by truck from different mines. In order to handle these variances, a blending plant (consisting of a stacker and re-claimer) was constructed. As a result, the existing staiths were no longer required and were removed, thereby increasing the coal holding capacity of the stockpile by 40 % (about 40 000 tons), from 4 days burn rate to 7 days burn rate (without any increase of its footprint).

These modifications were done in order to meet the user requirement specifications, eliminate load losses associated with blockages, optimise coal storage capacity and reduce risks (related to the shorter burn rate) and costs (associated with load losses) (Eskom, 2006a).

In addition, the entire coal stockpile yard platform was rebuilt and lined with an impermeable clay layer approximately 400 mm thick in order to prevent contaminated water to enter the natural ground water system. The separation of clean storm water and dirty run-off from the coal stockpile is achieved by means of a double drainage system which effectively prevents the mixing of clean and dirty water. Polluted water

[1] A live stockpile is constructed by coal (from either static or stacker / reclaimer system), onto the ground or, tipped truck loads and such coal is "pushed-up" to form a larger heap. The pile has no compaction by mobile equipment (i.e. it is a loose pile) and usually has a bulk density of between 0,95 and 1,05 ton/m^3.

channels were constructed in order to contain polluted rainwater runoff from the coal stockpile, they are reticulated to a series of pollution dams (**Figure 4**). The polluted water system for storm water run-off from the coal stockyard is designed for a 1:50-year flood event (Goba, 2006a and 2006b).

Coal at Komati Power Station is transported on trucks from several mines in the region to the coal stockyard which is designed to hold 116 000 tons of coal (capacity before the upgrade was 60 000 tons).

The coal is delivered and stacked at the stockyard by means of front loader and bull dozer then later fed to the unit bunkers through the conveyor system via the buffalo feeder or reclaimer. (Eskom, 2010).

Upgrading and expansion of the coal stockpile yard commenced in May 2007 and was completed in February 2008 (Refer to **Figures 9b&c: Photograph of coal stockyard**).

5.1.3 Construction of the Third Recovery Dam

The purpose of the third recovery dam is to retain the runoff volume that is captured by Lake Stoffel (from the terrace) for the duration of a heavy rainfall period, until the cooling towers are able to evaporate this flow again (Goba, 2006c).

The third recovery dam has a capacity of 120 000m^3 and a footprint of 27 744 m^2. It was built outside the terrace area and is designed to act as a storage area for a 1:50 year storm event (minus storage at Lake Stoffel). Although polluted storm water from Lake Stoffel and Lake Finn (existing polluted water control facilities) is diverted to this dam, normal operating conditions are such that the dam is operated as close to empty as possible. Water contained in this dam is recycled back into the Cooling Water (CW) System via a gravity feed to the East CW Forebay if the quality is within specification (**Figure 4**).

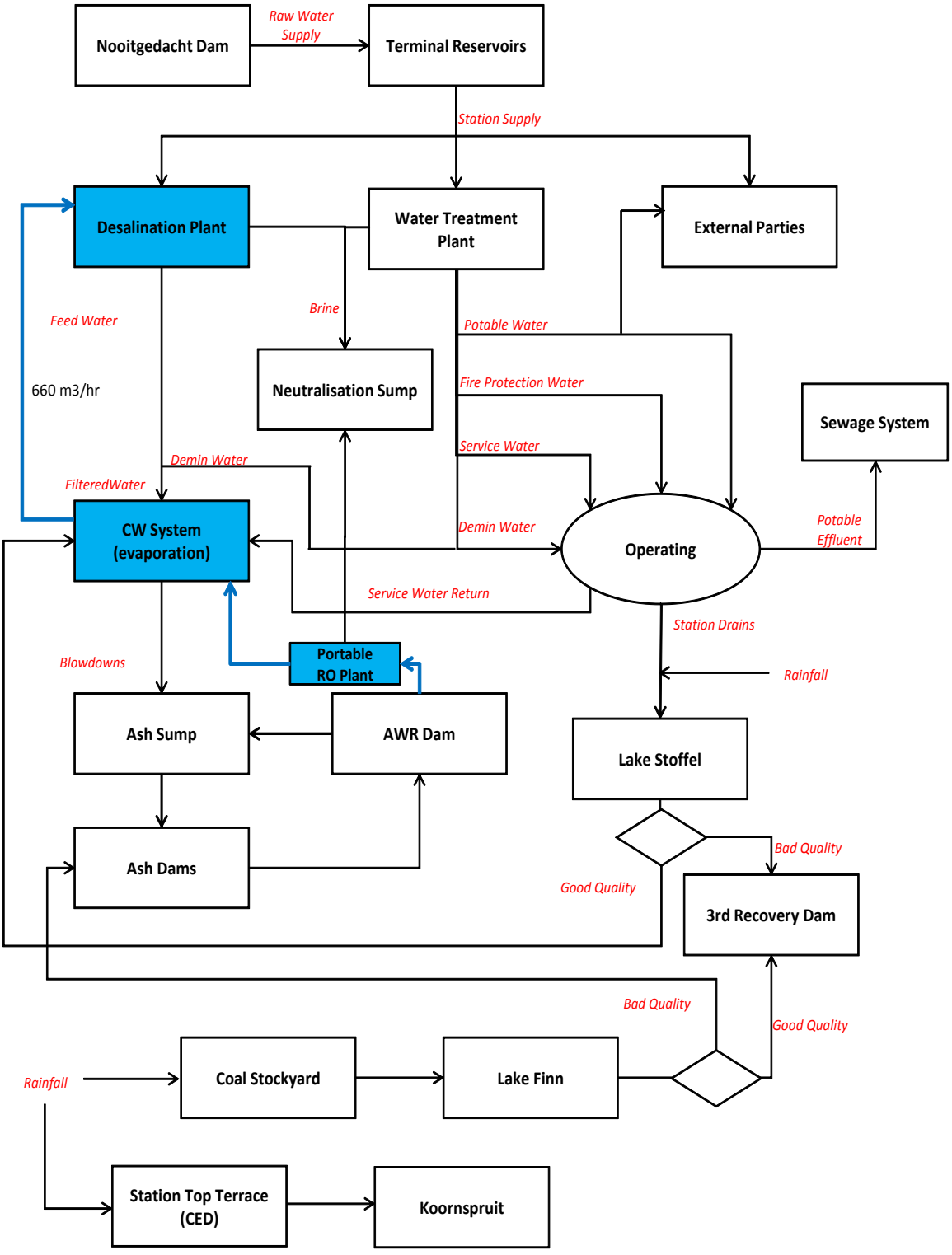


Figure 4: Komati water reticulation system

The dam is designed to have no underground seepage.

To calculate the volume (i.e. capacity) required of this dam, the wettest 14-day cycle was used, and the volume of runoff generated by the Terrace and the Coal Stockyard required to be pumped during these 14 days from the respective dams was calculated to be 120 000 m^3. This dam is compartmentalized to contain the terrace and coal stockyard runoff separately: 95 000 m^3 for the terrace runoff and 25 000 m^3 for the coal stockyard runoff (Goba, 2006c) (Refer to **Figure 9e: Photograph of Third Recovery Dam**).

Construction of the 3rd recovery dam started on 26 March 2007 and was completed on 20 June 2008.

5.1.4 Construction of Desalination Plant

Prior to mothballing Komati Power Station, the main condenser cooling water treatment system incorporated side-stream softening/alkalinity control using ash water and sulphuric acid, and turbidity control was achieved by the addition of polyelectrolyte and settling in the horizontal sedimentation basin. Both East and West condenser cooling water (CCW) plants had associated side-stream treatment.

Prior to the commissioning of the desalination plant, the demineralised water requirements for commissioning and commercial operation of the units (unit 9 and unit 8) were achieved on the ion exchange plant which was refurbished for this purpose. It was at this stage that a gap was identified in the water balance. Due to insufficient effluent sink, there was excess water in the ash water return dam that caused a challenge in terms of water management on site.

In addition to this, incidents of oil contamination of the cooling water occurred as a result of oil leaks from the turbine auxiliary system (lubricating and seal oil coolers) into the cooling water. Consequently this oil contaminated cooling water was unfit for feed to the desalination plant as it would irreversibly foul the membranes.

Production of demineralised (demin) water by the old demin plant presented the following challenges:

- demin water produced by the demin plant was insufficient to meet the demin water requirements;
- the demin plant did not meet the ZLED requirements;
- the use of the demin plant alone presented a risk of non-compliance with the water quality requirements of the WUL and required further abstraction from the Komati scheme.

Therefore, due to the cost of refurbishment of these systems coupled with the need to address the excess effluent concerns, the original process was not re-instated upon the return to service of Komati Power Station. Instead, it was proposed that alkalinity control still be achieved with sulphuric acid dosing, while turbidity control will be achieved through ultra filtration. A common system would take suction from both East and West cooling circuits.

Further evaluation then suggested that a desalination plant be incorporated in the water treatment process that would recover the cooling tower blow downs for demineralised water production which would address the excess effluent concern at the power station (**Figure 5**). Indeed, approximately 80% of the spent regenerants, normally disposed of with the ash would be eliminated in the process while sodium chloride (used during the brine washing of anion ion exchange resins) use and disposal would be totally eliminated.

The capacity of the plant was therefore determined on the cooling water treatment and demineralised water requirements, rather than on the excess effluent volumes.

The desalinisation plant is designed to produce up to 5.7 Ml/day of demineralised water by treating 15.8 Ml/day of cooling water from the main condenser cooling water circuit. This would subsequently reduce cooling water blowdowns. It is however currently operating using raw water as the feed source due to the presence of oil and high total organic carbon in the cooling water circuit.

The brine generated by the desalination plant is discharged to the Ash Water Return (AWR) dam (**Figure 5**), and gets used for ash transportation to the ash dams.

A chemical storage building on site caters for 1 month storage of each of the dosing chemicals required for the operation of the desalination plant, namely:

- Polyaluminium chloride: 1 000 litres flowbin;
- Aluminium chlorhydrate: 1 000 litres flowbin;
- Hydrochloric acid: 1 000 litres flowbin;
- Sodium hypochlorite: 1 000 litres flowbin;
- Sodium meta bisulphate: 20 kg bags; and
- Anti scalent (Vitec 3 000/Genesys LF): 1 000 litres flowbin.

In addition, the following chemicals are stored in Eskom bulk storage tanks, on site:

- 98% sulphuric acid stored in bulk storage tank (capacity 48 tons);
- 48% sodium hydroxide stored in bulk storage tank (capacity 48 tons); and
- Isothiazolone (biocide) – 6 000 litre bulk storage tank.

Construction of the chemical storage building started on 22 September 2010. The chemical storage building has a combined storage capacity of 42 m^3 and therefore falls below the thresholds stipulated in listing notice 1 of 2010. The transport, storage and handling of chemicals are subject to Eskom's safety, health and environmental procedures which are implemented as part of the power station's EMS certification.

Refer to **Figure 9d: Photograph of Desalination Plant**.

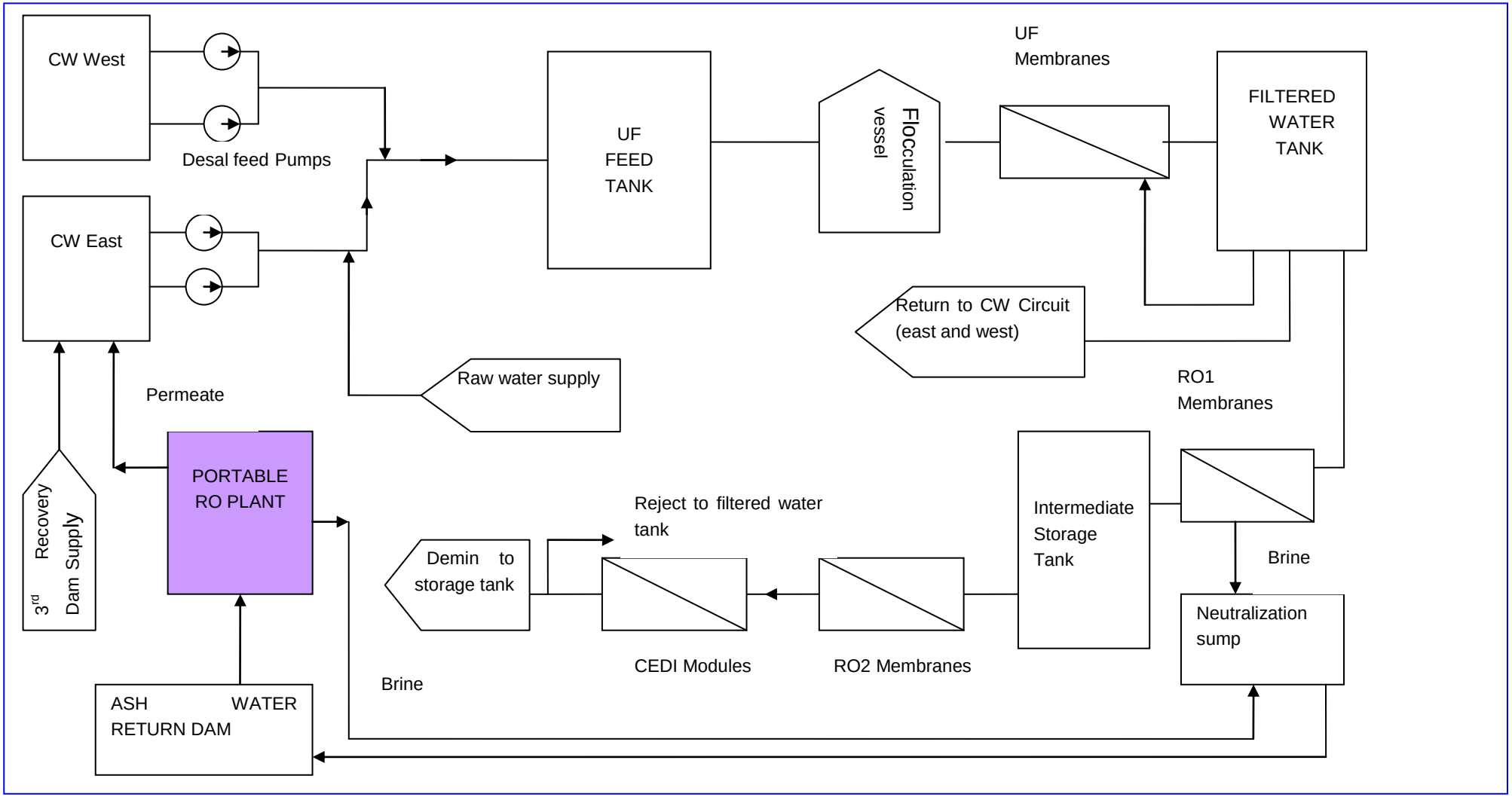


Figure 5: Process flow diagram for demineralised water production at Komati Power Station

5.2 NEMWA LISTED ACTIVITY

5.2.1 Construction of the Portable Reverse Osmosis (RO) Plant

The Desalination Plant is currently processing raw water as the feed source (due to the presence of oil and high total organic carbon in the cooling water circuit) (see section 5.1.4). This operating condition results in frequent blowdowns and accumulation within the station dams. The dams are presently operated at high levels and the risk of overflow increases during the high rainfall season. The water in the dams cannot be reclaimed without further processing due to the unsuitable chemistry.

The station procured a Portable Reverse Osmosis (RO) Plant to treat this effluent to within cooling water chemistry specifications, and reduce dam levels by re-using this water onsite.

The operating philosophy entails treatment of water from the Ash Water Return (AWR) Dam, discharging the product water (of potable quality) into the East Cooling Tower and the resultant brine into the neutralisation sump at the Water Treatment Plant (**Figures 4** and **5**). The plant is configured to have Ultrafiltration (UF Membranes) followed by inline pH correction and then Reverse Osmosis (RO Membranes) technology.

The portable RO plant is designed to produce 2 Ml/day of permeate of potable quality (feed of approximately 2.7 Ml/day)..

The portable RO plant can be moved and modified to treat other sources of water should the need arise (this may require authorisation from the relevant authority/ies).

Therefore the portable RO plant is intended to serve three purposes:

- Assist in treating the station's effluent water, allowing the station to recycle this water and minimise raw water intake.
- Treat the excess effluent generated during commissioning phases as well as during commercial operation when there are not enough units on load (hence insufficient sink capacity).
- Treat excess effluent that is generated when the desalination plant operates on raw water during periods of oil contamination in the cooling water.

Through usage of this plant, waste water will be treated, reused and contained, thereby reducing the abstraction of raw water and also preventing natural resource contamination (**Figure 9f: Photograph of RO Plant**).

The portable RO plant is currently not operational as it has been unable to meet its objective of feedwater (i.e. AWR Dam water) neutralisation. The current installed RO Plant dosing system employs concentrated Sulphuric Acid (98%), and has not been

effective to control and regulate the pH of the feedwater to within the specified pH range (6.5 <=pH <=7), under which the membranes perform optimally. The power station is envisaging a change in the feedwater dosing chemical from Sulphuric Acid (98%) to Carbon Dioxide (CO2) in order to resolve this issue. Carbon Dioxide reduces high pH levels quickly. It is not stored as an acid solution and is therefore considered safer than Sulphuric Acid. It is also non-corrosive to pipes and equipment; requires less equipment and monitoring costs; requires no handling costs, and can be utilized via a completely automated system.

5.3 LOCATION AND PHYSICAL SIZE OF ACTIVITIES

Table 5 1: Physical size of activities

Activity and associated infrastructure (footprints):	**Size**
Desalination plant	2 200 m^2
Portable RO plant	320 m^2
3rd recovery dam	27 744 m^2
Haul road	26 482.50 m^2
Coal stockpile yard	53 600 m^2
Area that has been transformed / cleared to allow for the activity as well as associated infrastructure	137 744 m^2
Total area (sum of the footprint area and transformed area)	110 346.50 m^2

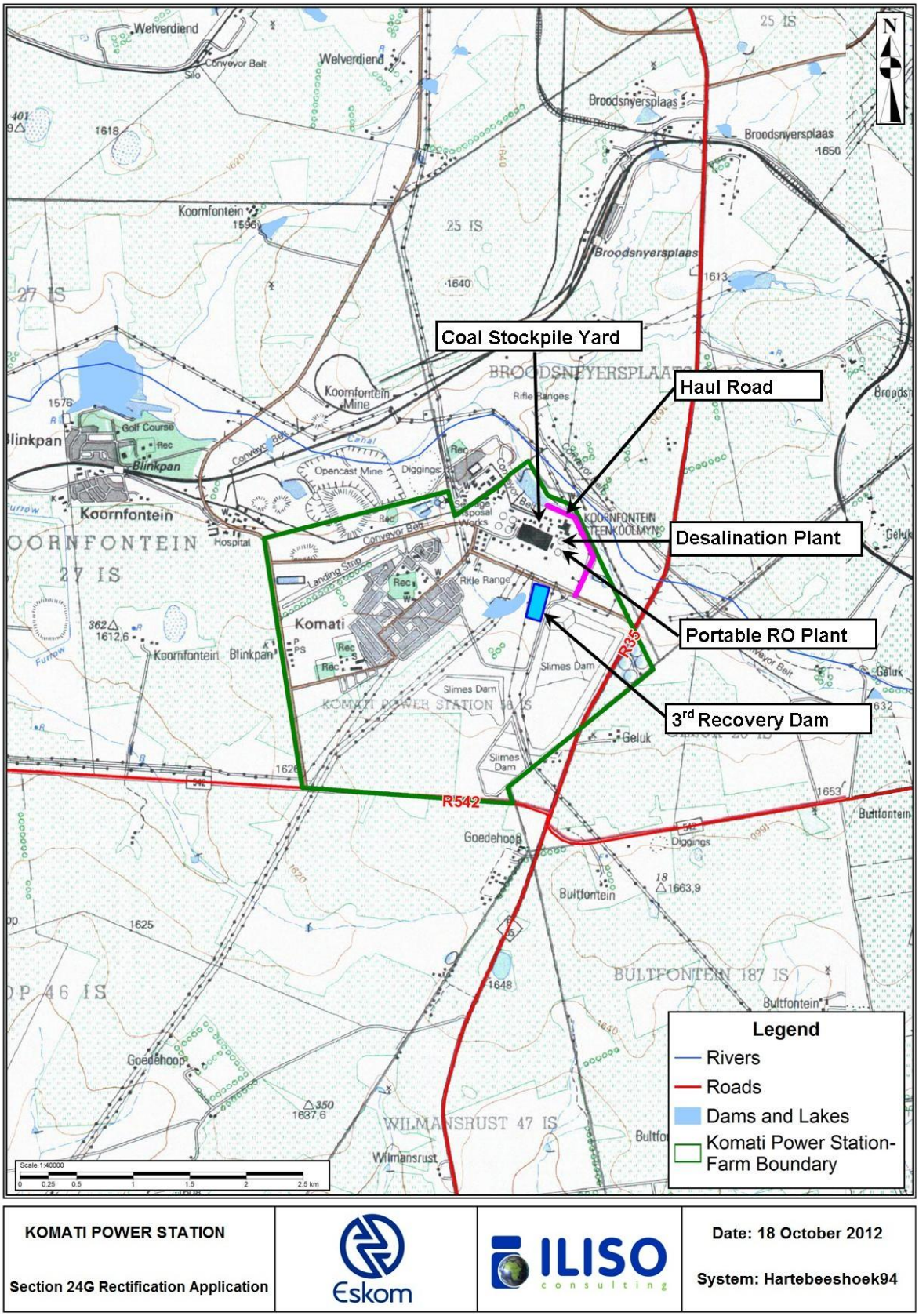


Figure 6: Site Layout Plan

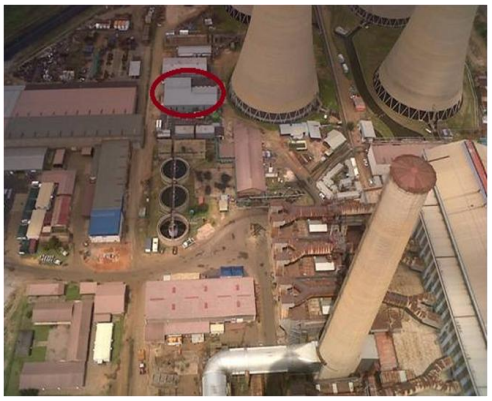
Figure 7: Location of NEMA listed activities

Figure 8: Location of NEMWA listed activity

a) Haul road to the East of the cooling towers

b) Coal Stockpile yard and adjacent old low level dam

c) Coal Stockpile yard and adjacent old low level dam



d) Desalination plant

e) 3rd recovery dam opposite high voltage yard and power station terrace to the East

f) Portable RO plant

Figure 9: Photographs showing listed activities

6. ALTERNATIVES

The following alternatives were considered in relation to the various facilities and infrastructure.

6.1 DESALINATION PLANT

6.1.1 Refurbishment of existing facilities

Komati Power Station was not originally designed as a Zero Liquid Effluent Discharge (ZLED) station but on return to service was required to comply with Eskom's ZLED philosophy. Eskom considered refurbishing the existing Ion Exchange (IX) plant to supply sufficient demineralised water for the commissioning of units 8 and 9. This alternative was environmentally not acceptable as it would have produced elevated amounts of effluent and salts and increased the salt loading on the ash dams (see also **section 5.1.4**). It was therefore decided to construct a new plant.

6.1.2 Location of desalination plant

The location of the desalination plant was based on the size required for the plant as submitted by the contractor, the availability of space as well as the best suited position considering the source of water (raw) and point of use of treated water to optimise piping and pumping requirements.

The space required for the plant was available in an open area in the vicinity of the water treatment plant. This was the best place to position it as the water produced is stored and furthermore is distributed from the existing demineralised storage tanks. This location was therefore deemed efficient due to its compatibility with existing facilities.

6.2 THIRD RECOVERY DAM - LOCATION AND SHAPE OF THE DAM

The dam is located in the area south of the access road and west of the existing Ash Tailings dams. The initial proposal was to build a central core earthfill dam, however, hydraulic conditions necessitated that the dam storage volume be created through mainly excavation and that a limited dam wall (embankment) be constructed.

6.3 HAUL ROAD AND ACCESS ONTO STOCKPILE

6.3.1 Supply of coal by conveyor belt

The option of transporting all coal via conveyor belt was rejected, as at the time of RTS beginning, the management of the power station decided that Komati would buy coal on the "spot market", and that coal would initially only be brought in by road.

For a coal conveyor belt to exist, a coal supplier needs to be contracted to supply coal for that belt. Although coal supply via conveyor can be suitable, at the time the RTS began, no such coal contract was in place, and no contract is as yet in place.

6.3.2 Route determination

The option of directing all trucks through the main access gate was rejected due to the expected high traffic load of up to 1 truck every 2 to 3 minutes as well as the high safety risk posed to motorists and pedestrians. The least cost option fulfilling all requirements was chosen (Eskom, 2006b).

6.4 COAL STOCKPILE YARD

6.4.1 Technological alternatives

Four alternatives were proposed as part of the coal handling engineering strategy:

- Option 1 consisted of the following components: truck off-load and sampling or stockpile roof, extending conveyors, increasing belt capacity, bin and chute modifications and staiths and stockpile systems.
- Option 2 consisted of the following components: truck off-load and sampling or stockpile roof, extending conveyors, increasing belt capacity, bin and chute modifications, staiths and stockpile systems and a blending facility.
- Option 3 consisted of the following components: truck off-load and sampling or stockpile roof, extending conveyors, increasing belt capacity, bin and chute modifications, and a blending facility.
- Option 4 consisted of the following components: truck off-load and sampling or stockpile roof, extending conveyors, increasing belt capacity, bin and chute modifications, a blending facility, and demolishing the staiths.

Option 1 was rejected as it did not address the user requirement specifications (URS) in terms of a blending facility, making it high risk and not cost effective. Options 2 and 3 were rejected as they did not offer the coal storage capacity increase needed to reduce risk (Eskom, 2006a). Option 4 (presented in **section 5.1.2**) was the preferred alternative as it addressed the URS as well as cost and risk factors: the blending facility without staiths complemented the station's future performance requirements and would reduce or eliminate load losses associated with blockages; it optimised stockpile capacity as the staiths area would be used for an effective 40 000 tons of strategic stockpile; it was cost effective and low risk as it used the best technology available for dealing with trucked-in coal with lots of fines over short periods of time.

6.4.2 Location of the coal stockpile yard

Location alternatives for the coal stockpile yard were not considered as the existing coal stockpile yard, once upgraded, was suitable for use after re-commissioning of the power station, and no increase of its footprint was required. It was therefore not necessary to build a new coal stockyard at a different location.

6.5 LOCATION OF THE PORTABLE RO PLANT

The location of the portable RO plant was based on the size required for the plant as submitted by the contractor, the availability of space as well as the best suited position considering the source of water (raw) and point of use of treated water to optimise piping and pumping requirements (Eskom, 2008). This location was therefore deemed efficient due to its compatibility with existing facilities.

7. DESCRIPTION OF THE AFFECTED ENVIRONMENT

7.1 VEGETATION

The desalination plant, portable RO plant, haul road and coal stockpile yard are located within the Power Station premises. The respective sites were therefore substantially transformed, degraded and disturbed pre-commencement and no baseline exists of the vegetation and groundcover of the power station prior to re commissioning.

Information on the vegetation and groundcover of the area around the 3rd recovery dam has been extracted from the ecological study conducted for the ash dam (Hemming, 2008), of which the northerly toe is located approximately 30 m away from the 3rd recovery dam's southerly toe.

The area around the site is vegetated with a mixture of natural and secondary grasslands that are composed of various species typical of primary and disturbed veld, as well as various invasive species. The majority of the area is dominated by a grass sward of indigenous grasses, but many of the species on the site are typical of disturbed areas. Common species include *Hyparrhenia hirta, Cymbopogon validus, Sporobolus spp* and *Melenis repens.* In some places the grass sward has been extensively invaded by Kikuyu. There are a number of stands of exotic trees across the area; these include species such as the Black Wattle, Poplar, Willow and Bluegum. In addition there are numerous weed species occurring on the site including: the Spear Thistle (*Cirsium vulgare*), Cosmos (*Cosmos bipinnatus*), Tall Khakiweed (*Tagetes minuta*), and Large Thorn-apple (*Datura ferox*) (Hemming, 2008).

As a result of the long history of disturbance at the site and in the area in general, no species of conservation concern are expected to persist. Most of the area has been subjected to agricultural and mining activities in addition to the development of the power station.

7.2 FAUNA

Fauna in the area is limited by the disturbed nature of the area, resulting from Agriculture, Power Generation, Mining and Residential Activities. A number of common grassland bird species were observed in the natural and secondary grasslands, however no sensitive and/or species of conservation concern were observed or are expected to occur. Various water and wetland bird species have been observed on the Gras dam and wetland areas at the ash dam site. These included species such as White-faced Whistling Duck, Egyptian Goose, Yellow-billed Duck, Reed Cormorant, Sacred Ibis, Cattle Egret, Hadeda Ibis, Cape Weaver, Twany-flanked Prinia and Nedicky. All of these species are widespread and highly adaptable in their use of disturbed habitats.

It is likely that common mammal species frequent the area, either permanently or on a transient basis. As a result of the long history of disturbance at the site and in the area in general, no sensitive mammal species and or species of conservation concern are expected to persist (Hemming, 2008).

7.3 WATER QUALITY AND WETLAND

The study area occurs within the upper Olifants Water Management Area (WMA), Highveld aquatic Ecoregion and B11B quaternary catchment that have been classified as a Class D (largely modified) system.

In terms of ecological functions, importance and sensitivity, the following points summarise the conditions in this catchment:

- The riverine systems in this catchment have a high diversity of habitat types which include wetlands.
- The catchment has a moderate importance in terms of conservation areas and conservation of biodiversity.
- *Barbus* (fish) species which occur within the riverine resources and have a moderate intolerance to changes in flow and flow related water quality.
- The area has a moderate importance in terms of faunal migration.
- The area has no importance in terms of rare and endangered species conservation.
- The area is regarded to be of high importance as a local source of refugia for aquatic species.
- The catchment has a moderate sensitivity to changes in water quality.
- The catchment has a moderate sensitivity to water flow changes.
- The catchment has a moderate species/taxon richness.
- The catchment has no importance in terms of unique species conservation.

The Koringspruit River traverses the area. It has been classified as a Class D (largely modified) River.

Several wetland features have been identified to fall in close proximity to the power station (**Figures 10** and **11**) (**Appendix C**).

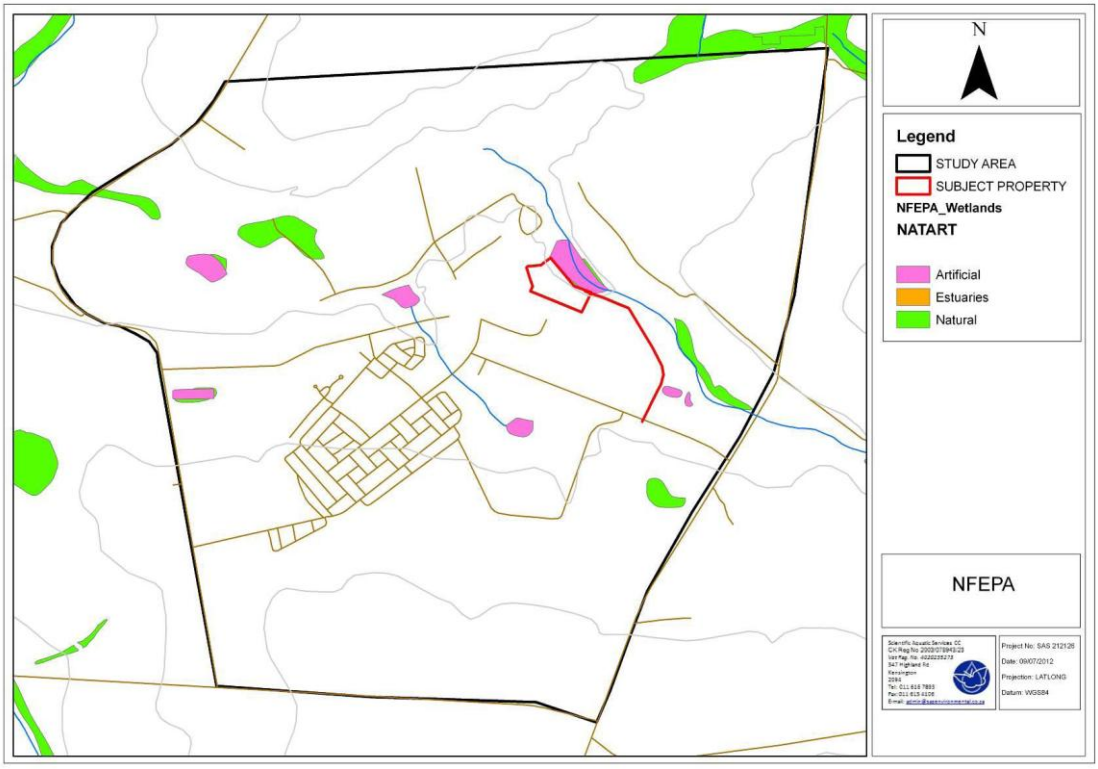


Figure 10: Location of artificial and natural wetland features within the study area (van Staden, 2012)

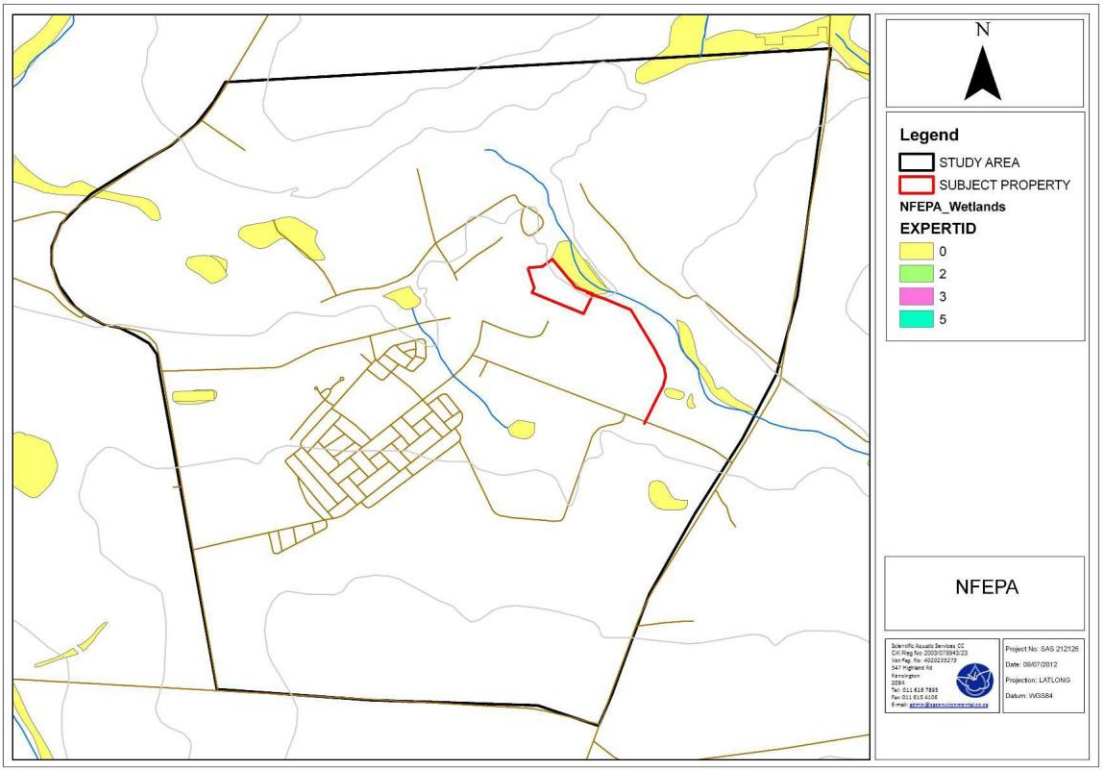


Figure 11: Wetlands indicated to be of importance towards biodiversity conservation (0 = no importance indicated). (van Staden, 2012)

From the wetland delineations the haul road and associated stockpile does not occur within the wetland boundary, but does occur within the 32 m buffer zone (**Figure 12**).

Figure 12: Wetland delineation depicting the Sensitivity and 32m buffer zone (van Staden, 2012)

7.4 SOIL AND GEOLOGY

Information on the geology and soils in the study area has been extracted from the ecological study conducted for the ash dam (Hemming, 2008).

The bedrock geology of the site comprises of sediments (shale, siltstone and predominantly sandstone) of the Vryheid formation. Elsewhere, the sandstone bedrock is sequentially overlain by clayey residuum derived from in situ decomposed shale followed by transported silty/sandy hillwash and clayey/sandy alluvium along the local drainage course.

The regional geology consists of various groups of the Karoo Supergroup with numerous dolerite intrusions. Shale and sandstone elements of the Vryheid formation dominate locally.

Soils of the area are fine to medium sand and are reasonably deep. Land in the region is generally classified as arable and dryland agriculture is extensively practiced.

Two distinct aquifers occur in the Karoo rocks namely a shallow, weathered aquifer and a deeper fractured aquifer. In the Komati area the weathered aquifer extends to approximately 15m below surface. There is a strong relationship between surface topography and groundwater levels and the predominant groundwater flow is in a northerly direction. Borehole yields in this aquifer are generally low. The deeper fractured aquifer seldom constitutes an economic aquifer as a result of the low porosity of the Ecca group rocks. Water in the fractured aquifer is generally of a poorer quality as a result of the concentration of salts and the slow recharge rate. It is likely that the two aquifers are interconnected and that groundwater flows between the two.

7.5 AIR QUALITY

Air pollution concentrations in the Mpumalanga Highveld are elevated and sulphur dioxide and nitrogen oxides have been identified as criteria pollutants. Pollutant sources in the region include Eskom Power Stations, industrial emissions, blasting operations at mines, the spontaneous combustion of discard at coal mines, veld burning, vehicle exhaust emissions and household fuel burning. Elevated, suspended fine particulate concentrations also occur in the region. Local sources include wind erosion from exposed areas, fugitive dust from agricultural and mining operations, particulate releases from industrial operations, vehicle entrainment from roads and veld burning. Background maximum daily PM10 concentrations in the region were estimated to be between 25 µg/m³ and 75µg/m³.

7.6 NOISE

Noise in the Komati Power Station area emanates from the operations at the power station. Noise sources include the operation of heavy machinery and the handling of materials. Additional noise sources in the area include vehicles on the roads, mining operations and agricultural activities.

7.7 CLIMATE

The climate of the area is typical of the Highveld with moderate, wet summers and cold, dry winters. Average rainfall is 735 mm per annum and average daily temperatures range from less than 15°C in winter to the mid 20°C range in summer. Prevailing winds are from the north-east and north.

7.8 SOCIO ECONOMIC CHARACTERISTICS

Komati Power Station lies within the Steve Tshwete Local Municipality. The municipality has a growing economy dominated by agriculture, mining, electricity generation and industry.

Settlements in the area include the villages of Komati, Koornfontein and Blinkpan, local farmers and farm labourers. The region comprises agricultural lands, coal mining and electricity generation activities. Surface topography is fairly even and the ground slopes gently to the north-west.

Unemployment is approximately 30%. There is a permanent force of approximately 200 employees at the power station. There are approximately 440 residential stands in Komati Village. The village has been revitalised by the re-commissioning of the power station and significant economic stimulation and development is underway. Service provision in Komati Village is of a high standard with all houses having water, electricity and sewerage facilities (Hemming, 2008).

7.9 CULTURAL HISTORICAL CHARACTERISTICS

A Heritage Survey was undertaken in 2007 as part of the EIA for the Ash Dam Extension (Van Schalkwyk, 2007). The following findings have been made in relation to the historical, cultural and archaeological characteristics of the study area:

One historic event took place in the region: during the Anglo-Boer War, the British forces under Brigadier-General Beatson were attacked by the ZAR forces, led by General Muller. More than 50 British soldiers were killed. This battle took place on the farm Wilmansrust 47IS, just to the south of the power station. A monument to commemorate this event was erected on this farm, but during the early 1970s it was relocated to the town of Bethal (Van Schalkwyk, 2007).

Some informal farm cemeteries are located in the region, but none would be impacted on by the power station activities.

No sites or artefacts of heritage value were discovered on the site during the 2007 heritage survey, although burial sites are associated with many of the farm homesteads.

8. NEED AND DESIRABILITY

Komati Power Station is a vital link in the power supply to the national grid. The power supply to the country is particularly stretched at the present time, so much so that Aluminium Smelters have already had power supply cuts on a number of occasions, to maintain system frequency and stability. Eskom has also had to run their gas turbines quite frequently for the same reason (the gas turbines cost of production is roughly ten times that of conventional power stations).

In order to assist the grid, and to minimise the use of gas turbines, Komati Power Station needs to operate efficiently. All the activities subject to this rectification application are necessary to maintain the power station fully operational. Further, the water treatment facilities (desalination plant and portable RO plant) will contribute to improve effluent management at the power station and need to be operational in order to keep the power station environmentally compliant with ZLED requirements, as well as Water Use Licence conditions.

It is therefore essential that the activities being applied for are allowed to continue and operate. The desalination plant, portable RO plant and 3rd recovery dam are all part of Komati's overall effluent management system. Taking the desalination plant off-load would result in the Generating units at Komati to be shut down due to demineralised water starvation. Similarly, the use of the haul road and coal stockpile yard is essential to maintain the supply of coal to the power station and keep it operational. Should the activities not be allowed to continue, this will have a negative impact on the electrical grid and will lead to high input costs by running the diesel turbines, as well as possible load shedding.

9. PUBLIC PARTICIPATION

9.1 ADVERTISEMENTS AND ON SITE NOTICES

Newspaper advertisements, informing the public of the project and inviting interested and affected parties to participate, were placed on 4 and 12 October 2012 in *The Star* and *The Middelburg Herald* respectively. Copies of these advertisements are provided in (**Appendix B)**.

Five on-site notices were placed on 28 September 2012 on the property periphery, conspicuous positions around the site as well as inside the entrance/administration building of the power station (**Appendix B)**.

9.2 STAKEHOLDER NOTIFICATION LETTERS

The following stakeholders received written notification of the application:

- Adjacent landowners and occupiers of the land;
- Ward councillor;
- Steve Tshwete Municipality;
- Non-Profit Organisations and Community-Based Organisations registered on the database;
- Mpumalanga Department of Economic development, Environment and Tourism; and
- Mpumalanga Provincial Heritage Resources Authority.

The letters were sent by email, fax, post, or delivered by hand.

9.3 BACKGROUND INFORMATION DOCUMENT

A background information document (BID) was compiled in English for circulation to all interested and affected parties (I&APs). The document included a response sheet, which provided persons with the opportunity to register as I&APs, list additional persons that would be interested in and/or affected by the project, provide comment and raise issues and concerns (**Appendix B**).

The BID was sent to all registered stakeholders.

9.4 PUBLIC REVIEW OF DOCUMENTS

This draft report is being made available to the public for a 40-day comment period. Electronic copies of this report will be made available for download on the ILISO website (www.iliso.com) and hard copies will also be available at the local school.

Registered stakeholders have been notified in writing of the availability of the draft report.

A summary of all issues and comments received during the stakeholder consultation process, as well as of correspondence in that regard is captured in an Issues and Responses Report that forms an Appendix to the EA Report (**Appendix B**).

The list of registered I&APs is included in **Appendix B**.

10. SPECIALIST STUDIES FINDINGS AND RECOMMENDATIONS

10.1 WETLAND AND AQUATIC ECOLOGY

The wetland and aquatic ecology specialist study was compiled by Stephen van Staden, from Scientific Aquatic Services, on behalf of ILISO. The study was undertaken in July and August 2012. The full report is included in **Appendix C**.

10.1.1 Findings

The affected wetland feature's Present Ecological State was determined to be a Class C wetland - moderately modified.

From the wetland delineations the haul road and associated coal stockpile do not occur within the wetland boundary, but do occur within the 32m buffer (see **Figure 12**). Infilling and terracing may have occurred in order to develop the coal stockpile and associated haul road, which would have reduced the extent of the wetland and directly affected it.

Water quality data was collected from sites upstream (26°5'13.54"S, 29°28'23.99"E) and downstream (26°5'6.58"S, 29°28'19.28"E) of the coal stockpile yard (**Figure 13**).

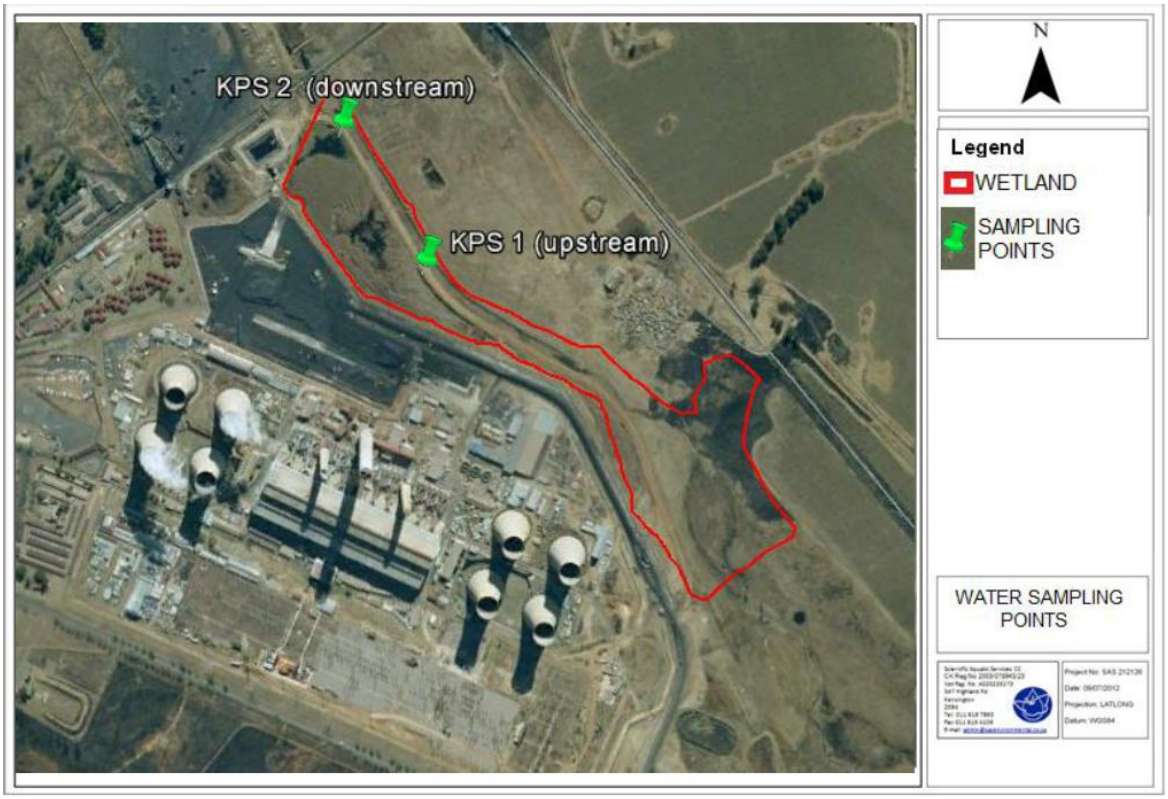


Figure 13: Water quality sampling points used for wetland and aquatic study (van Staden, 2012)

The water quality results show:

- The upstream site showed alkaline pH levels (7.60) while the downstream site is significantly acidic (3.20) (see **section 11.3**). Acidic conditions decrease aquatic biodiversity and these conditions can become toxic to fish and other sensitive aquatic species.
- The pH between the upstream and downstream site decreased by 57,9%. This degree of decrease significantly exceeds the five percent change from reference conditions advocated by DWA.
- The significant change in pH from the upstream to downstream sites is of serious concern.
- The Electrical Conductivity (EC) for the upstream site is five percent lower than the Olifants River Ecological Water Requirements Assessment (OREWA) 2001 standard for the upper Olifants River. In addition, relating to the OREWA (2001) document the water quality in the system for the downstream site exceeds the OREWA standard by a factor of ten. A significant impact form osmotic stress and possibly some specific salts on the aquatic community of the system are deemed likely.
- The EC between the upstream and downstream site increases by 77.24%. This degree of increase significantly exceeds the 15% change from reference conditions advocated by DWA and it is important to note that the upstream site has already deviated from the reference conditions expected in the catchment under natural conditions.
- The upstream site shows significantly low levels of dissolved oxygen in the water, indicating that oxygen levels are depleted through biological processes. These low levels of oxygen would not be sufficient to sustain all but the most tolerant aquatic species. The downstream site shows improved levels of oxygen compared to the upstream site. The levels of oxygen dissolved in the water at downstream are sufficient to sustain adequate respiration of aquatic species.

Toxicity was assessed at the same sites, upstream and downstream of the coal stockpile. The toxicological results showed:

- *Vibrio fischeri* (bacterial sample) shows the greatest sensitivity to the water quality samples.
- There is a slight acute hazard in terms of toxicological class for the upstream site, whilst the downstream site is classed as a severe acute hazard. The significant change in toxicological class between the upstream and downstream points indicates that the water quality is severely impacted on and is toxic to the receiving aquatic environment and the water quality will not be suitable for aquatic invertebrates or other aquatic species. The aquatic ecology will thus not

be able to maintain an adequate environment for sensitive and most likely even more resilient species.

- The toxicological data also suggests that the activities adjacent to the wetland system, which include the coal stockyard and haul road, are having a severe impact on the water quality within the system and are highly likely to impact on the aquatic ecology of the system. The coal stock pile is however separated from the water area by cut off trenches/channels in order to avoid impacts on the stream below. Historical pollution or ground water migration may thus be contributing factors.

10.1.2 Key recommendations

After conclusion of the wetland biodiversity assessment, it is the opinion of the ecologists that, in addition to complying with WUL conditions and relevant DWA Licensing regulations and surface and groundwater monitoring and management requirements, the following recommendations be adhered to:

- No further activities are to infringe upon the wetland boundaries or associated buffer zones. Should this be absolutely unavoidable that power station activities occur within these areas, relevant authorisation should be obtained according to the National Environmental Management Act (NEMA) 107 of 1998 and Section 21 (c) and (i) of the National Water Act 36 of 1998;
- Ensure that all storage, effluent and low level dams/ponds are maintained and regularly inspected for seepage. Ensure that all hazardous storage containers and storage areas comply with the relevant SANS standards to prevent leakage;
- Reinforce banks and drainage features where necessary with gabions, reno mattresses and geotextiles to prevent erosion (the necessary authorisation(s) should be obtained prior to undertaking these activities);
- All rubble, construction debris and litter should be removed from the wetland area;
- It is deemed essential that a detailed wetland monitoring program be developed in which the Wetland PES and Ecoservices of all potentially impacted wetlands is monitored on an annual basis in the summer. If it becomes evident that the systems are suffering harm or that there is a loss in Ecoservices taking place, measures to minimise these impacts should be sought;
- A toxicological assessment program should be initiated to monitor the toxicological risk that the power station process system poses to the receiving aquatic environment and to monitor to the toxicological impact on the receiving wetland/aquatic environment. Measures to mitigate any new emerging impacts need to be identified within these monitoring reports in conjunction with management of the power station.

10.2 AIR QUALITY STUDY

The air quality specialist study was compiled by Stuart Thompson from Royal Haskoning DHV, on behalf of ILISO Consulting. The study was undertaken in July and August 2012. The full report is included in **Appendix C**.

10.2.1 Findings

Figure 14 provides an indication of the impacts for the original operations on site (i.e. prior to the expansion of the coal yard and haul road). Input parameters for original operations assumed a coal stockyard capacity of 60 000 tons which was housed in staiths, until after the return to service (2008), when the coal yard was upgraded and expanded to 116 000 tons through the removal of the staiths. Original conditions for the haul road, assumed no vehicle movement, due to all coal being transported from the mine to site via conveyor.

For the 24 hour averaging period, the maximum concentration for original operations was estimated to be 122.83 µg/m³, which is slightly above the National Standard set at 120 µg/m³. The predicted concentrations over an annual averaging period, where the National Standard is set at 50 µg/m³ with the maximum predicted concentration being 19.66 µg/m³, is well below the National Standard.

The South African standard for the Evaluation of Inhalable Particulate Matter (PM10), laid out in the National Environment Management: Air Quality Act. No. 39 of 2004 allows for 4 daily exceedances per year.

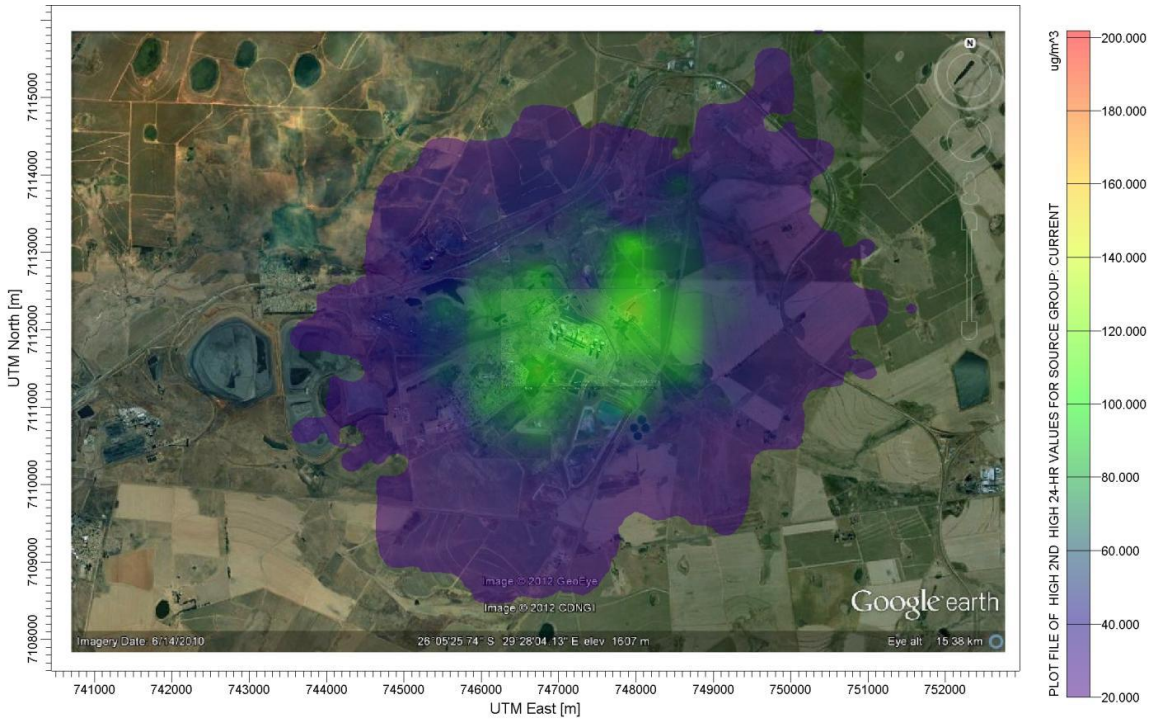


Figure 14: Predicted impacts associated with the original operations for a 24 hour averaging period (Standard 120µg/m³) (Thompson, 2012)

Figures 15 and **16** provide an indication of the impacts of the current operations on site, including the expanded coal yard and haul road. For the 24 hour averaging period the maximum predicted concentration is 200.22 µg/m³, which is above the National Standard set at 120 µg/m³. The predicted concentrations over an annual averaging period, where the National Standard is set at 50 µg/m³, with the maximum predicted concentration being 35.65 µg/m³, are well below the National Standard.

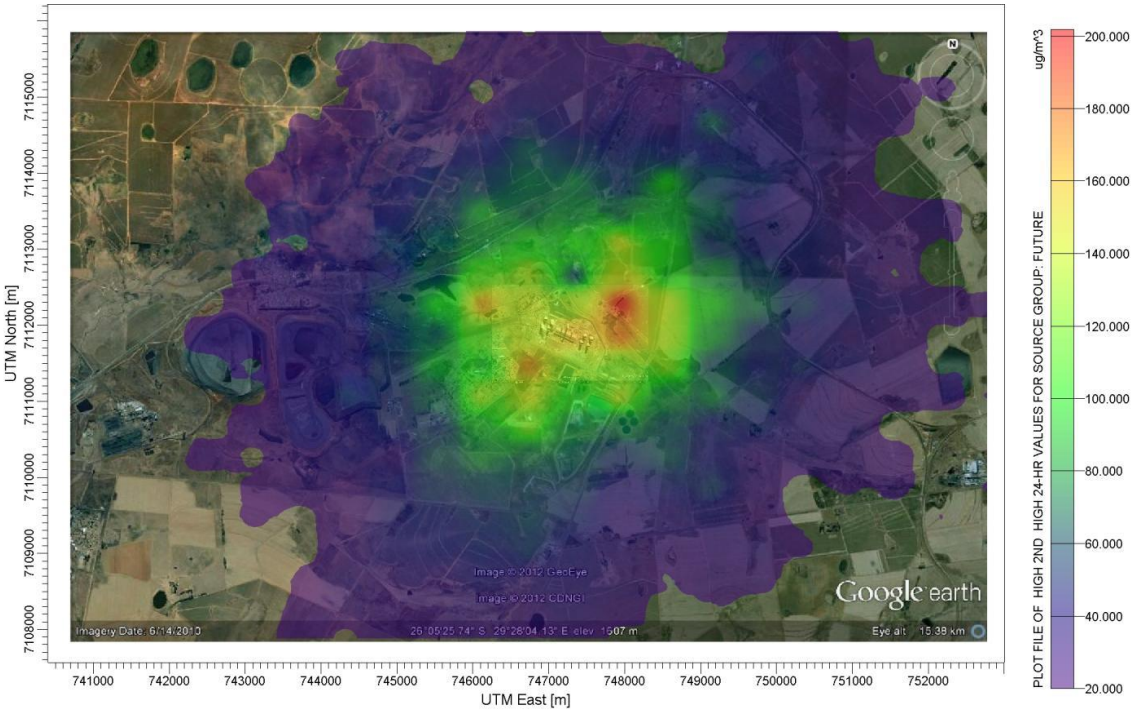


Figure 15: Predicted impacts associated with the current operations for a 24 hour averaging period (Standard 120µg/m³) (Thompson, 2012)

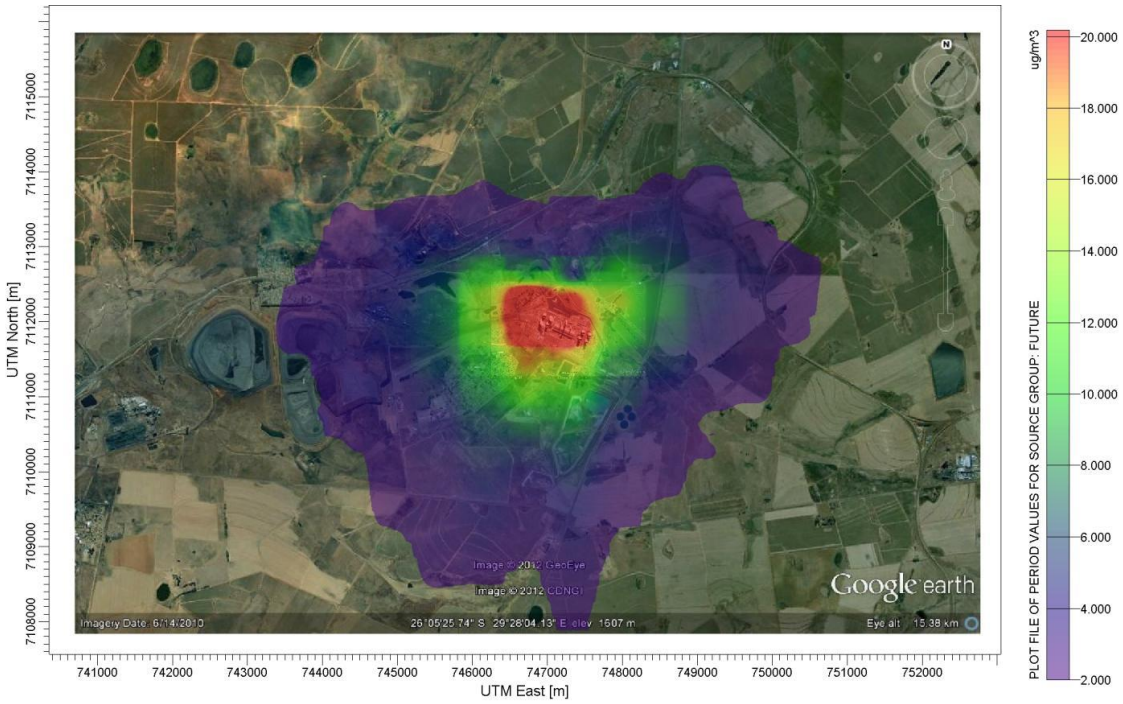


Figure 16: Predicted impacts associated with current operations for an annual averaging period (Standard 50µg/m³) (Thompson, 2012)

There is approximately 38 percent increase in daily particulate matter impacts as a result of the use of the larger coal stockyard and haul road, with an increase of 44 percent for the annual concentrations (**Table 1**). Whilst the estimated impacts from the original stockpile and haul road did exceed the standards, with the expansion, the exceedance has increased, and therefore mitigation measures are necessary to reduce the particulate matter emissions from the road and stockyard and ensure all national standards are adhered to.

Table 1: Maximum predicted on-site concentrations (Thompson, 2012)

	24 Hour (µg/m³)	Annual (µg/m³)
Original Operations	122.83	19.66
Current Operations	200.22	35.65
Percentage Increase	38.65 %	44.83 %
National Standard	120	50

Note: Onsite concentrations are determined based on the maximum predicted concentration. The South African Air Quality Standards are based on a site boundary figure and not necessarily on a maximum predicted figure

Figures 17 to **19** provide an indication as so the predicted emission from the Haul trucks delivering coal. All results show no exceedances to any of the South African Standards.

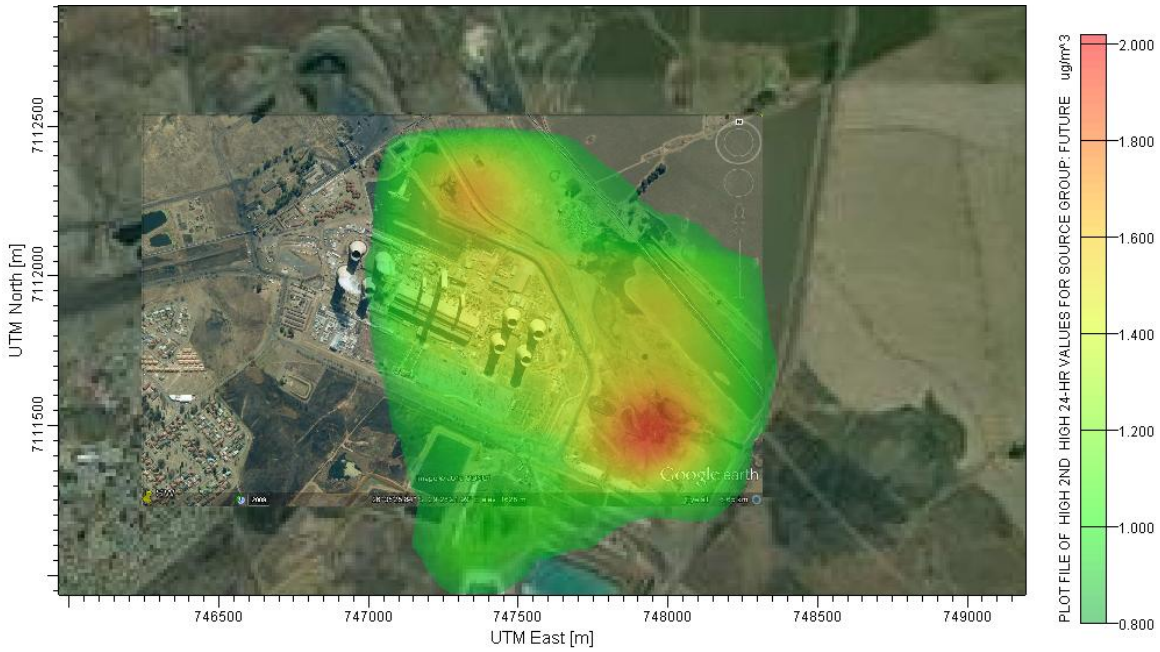


Figure 17: Predicted Diesel Particulate impacts associated with haul trucks for the current operations for a 24 hour averaging period (Standard 120µg/m³)

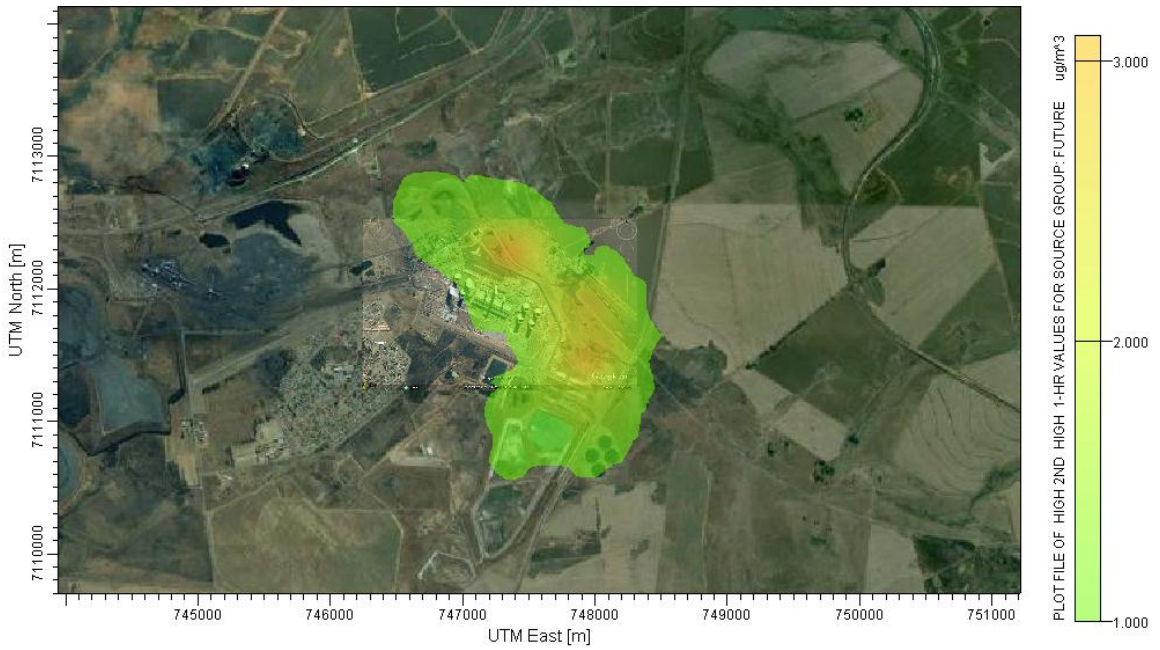


Figure 18: Predicted Benzene impacts associated with haul trucks for the current operations for an annual averaging period (Standard 10µg/m³)

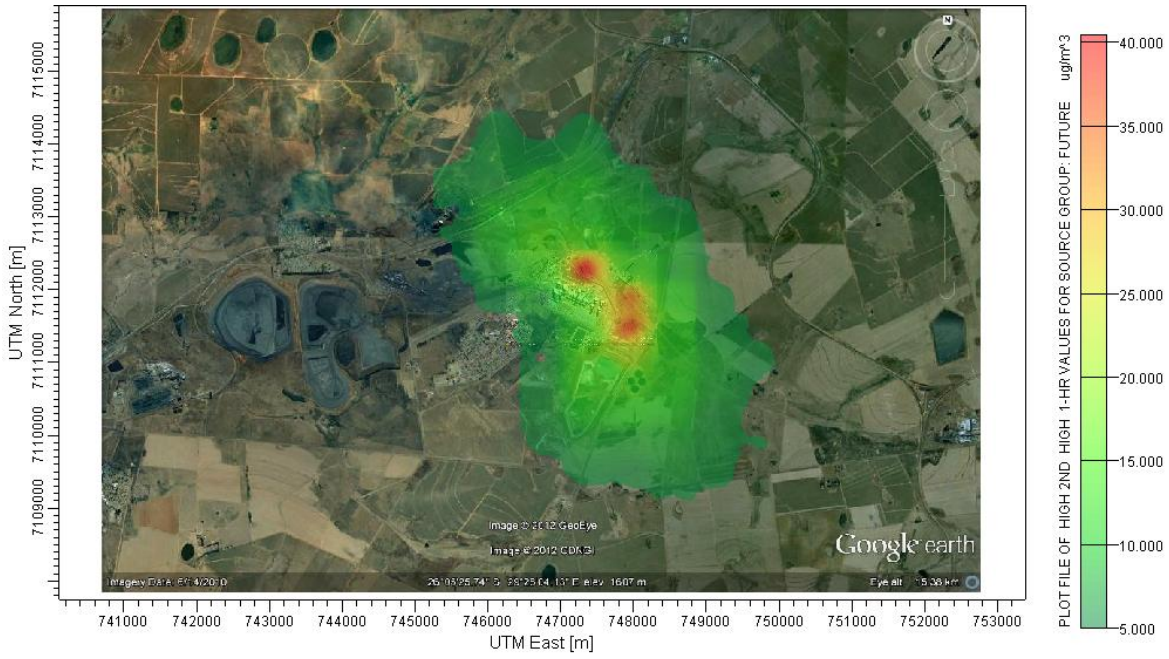


Figure 19: Predicted Oxides of Nitrogen impacts associated with haul trucks for the current operations for an hourly averaging period (Standard 200µg/m³)

10.2.2 Recommendations

In addition to the provisions made in the Komati Power Station's Fugitive Emission Management Plan (Eskom, 2010), the following recommendations were made by the air quality specialist in order to mitigate the air quality impacts associated with the haul road and coal stockyard:

- Due to emissions being generated from roads and storage piles it is recommended that a water spray system be operated at any stockpiles, and in particular when tipping of coal.
- It is also recommended that wind breaks be used in close proximity of storage piles in order to reduce the potential erosive forces of the wind.
- During the transfer of material to piles, drop heights should be minimised to control the dispersion of materials being transferred.
- Wind speed monitoring is recommended to ensure that mitigation measures are stepped up when wind speeds increase and when windblown dust is noted to increase.
- Speed limits on the haul roads should be implemented and enforced to ensure dust is not liberated from the movement of trucks.
- The watering of the haul roads will also significantly reduce particulate emissions. Water may be combined with a surfactant as wetting agent to increase the control efficiency if water is insufficient for adequate control of dust, particularly on the haul road. Surfactants increase the surface tension of water, reducing the quantity of water required. Chemical stabilisation is of longer

duration but is not cost effective for small-scale operations. Nozzles fitted on a spread bar behind trucks for a controlled spray opposed to a wide splash set-up.

11. DESCRIPTION OF ENVIRONMENTAL IMPACTS IDENTIFIED

The following environmental issues and impacts were identified.

11.1 AIR QUALITY

Construction activities for the various listed activities are likely to have generated dust and gas emissions due to the clearing of groundcover, tipping of material to storage piles, levelling of areas, wind erosion from storage piles, vehicle and construction equipment activity, and tailpipe emissions from vehicles and construction equipment such as graders, scrapers and dozers.

Air quality impacts associated with the operation of the third recovery dam, the desalination plant and portable RO plant are expected to be very low.

Impacts from the coal stockyard and haul road during operation are in the form of dust related to coal storage (i.e. wind erosion), handling and transfer of coal (especially tipping of coal), dust caused by transport vehicles travelling on the road, as well as vehicle exhaust emissions from truck transport.

The residential, educational and recreational land uses are considered to be sensitive receptors. There are a number of small human settlements in the areas as well as farmers and labourers working on surrounding farms which, based on the distances from the proposed site, may be impacted on.

Other sensitive receptors within the area would be the local fauna and flora. It has been identified that dust settling on the leaves of plants can result in the damage to plants and inhalation of dust may results in sickness and associated lung diseases for wildlife and humans present in the vicinity of the power station (Thompson, 2012).

11.2 WETLAND AND AQUATIC ECOLOGY

Impacts on wetland and aquatic ecology are caused by a number of sources (van Staden, 2012), as described below.

Encroachment by power station activities

Construction of the coal stockpile yard and haul road have encroached into the wetland buffer zone. Further construction or operational waste materials into wetland areas could occur and would affect the habitat integrity of these areas.

The power station and its related infrastructure (coal stockpile yard and haul road *inter alia*) may have caused degradation of the overall wetland area, which, along with fragmentation and loss of wetland habitat would impact negatively on wetland integrity and aquatic health.

Seepage of dirty water

Seepage from power station facilities, general dirty water areas as well as spillages of hydrocarbons has the potential to contaminate the groundwater environment, which in turn can affect water quality in surface water sources in the area (see also **Section 10.3**).

The 3rd recovery dam has had incidents of spillages that are against the ZLED philosophy and water license agreement and this negatively impacts the station compliance with environmental indicators and requirements by the Department of Water Affairs (DWA).

Level indicators are installed at all dams and are monitored on a regular basis, especially after rains. The dams are operated at the lowest level practically achievable to ensure that sufficient buffer capacity is available to accommodate polluted effluent retention during emergency situations.

Vehicles entering sensitive areas

Vehicles entering sensitive areas may have impacted on sensitive wetland areas during construction of the haul road and upgrading of coal stockyard, resulting in a loss of habitat and wetland functioning. This impact may also occur during operation and rehabilitation.

Ineffective rehabilitation

Ineffective rehabilitation of wetland areas could cause siltation, erosion and changes in the hydrological functioning of these areas. Wetland habitat may remain transformed after decommissioning and closure.

Furthermore, seepage from any decommissioned power station facilities may occur post-closure if rehabilitation is not effectively implemented.

Destruction of the wetland areas

Destruction of the wetland areas may lead to a loss of ecological service provision in terms of habitat provision, nutrient trapping, flood control and water purification among others.

Impacts due to sedimentation and erosion

Many of the systems in the area have already been significantly impacted upon through increased sediment loads occurring in the systems. Impacts due to sedimentation can be significant and have the potential to affect the biodiversity and functioning of the system. With disturbance of the soils associated with the project, there is a risk of sedimentation of the wetland systems and the possible loss of aquatic refugia.

The affected wetland feature's Present Ecological State was determined to be a Class C wetland - moderately modified.

Impact on overall faunal biodiversity due to impact on habitat and migratory corridors

The area has a moderate importance in terms of faunal migration. Construction activities (e.g. clearing of land for infrastructure and services placement) and to some extent operation of the listed activities might lead to destruction of habitat and overall loss of biodiversity. Impacts on habitat may lead to a loss of migratory routes and existing migratory corridors of more mobile species. Bird species using the wetland area may be impacted on, and the loss of habitat may cause these species to find other wetland alternatives. More sensitive aquatic invertebrates found within the wetland and riparian areas will also be impacted on and are most likely the first species to be lost.

Overall fragmentation and destruction of habitat, loss of ecological function, decrease in the availability of fodder for herbivores and reduced landscape function may lead to a reduced ability of the study area and surrounds to support a diverse and abundance of faunal species.

All wetlands within the study area are however considered unimportant with regards to the conservation of biodiversity.

Impact on aquatic community sensitivity and diversity

The aquatic community is severely impacted on by the alteration of natural habitat units through the construction of the haul road within the 32 m wetland buffer zone. Many sensitive aquatic invertebrate species are often the first to be lost in situations where their habitat has been impacted on. Other aquatic species or amphibian species may be lost due to a habitat loss.

11.3 WATER QUALITY

Impacts on the quality of surface water may have occurred during the construction phases of the various activities due to clearing of vegetation, contamination of stormwater, spillages of hydrocarbons/dangerous goods and improper disposal of general waste. These impacts have been managed according to the power station's EMS and relevant Eskom policies which ensure effective mitigation of impacts.

During operation negative impacts on water quality can occur due to spills and leaks during the transport, handling and storage of hazardous substances (i.e. chemicals required for the operation of the portable RO plant and desalination plant). Spillages may cause the alteration of water quality through toxic contaminants and

hydrocarbons through runoff from road surfaces and discharge of solvent and other industrial chemicals.

Infiltration of dirty water from the coal stockyard may cause surface and groundwater contamination. While operation of the desalination plant and RO plant may cause groundwater contamination through the discharge of brine in the ash water return dam.

Surface and groundwater quality monitoring is undertaken quarterly. Samples are taken from a number of sites in and around the power station (**Figures 20** and **21**).

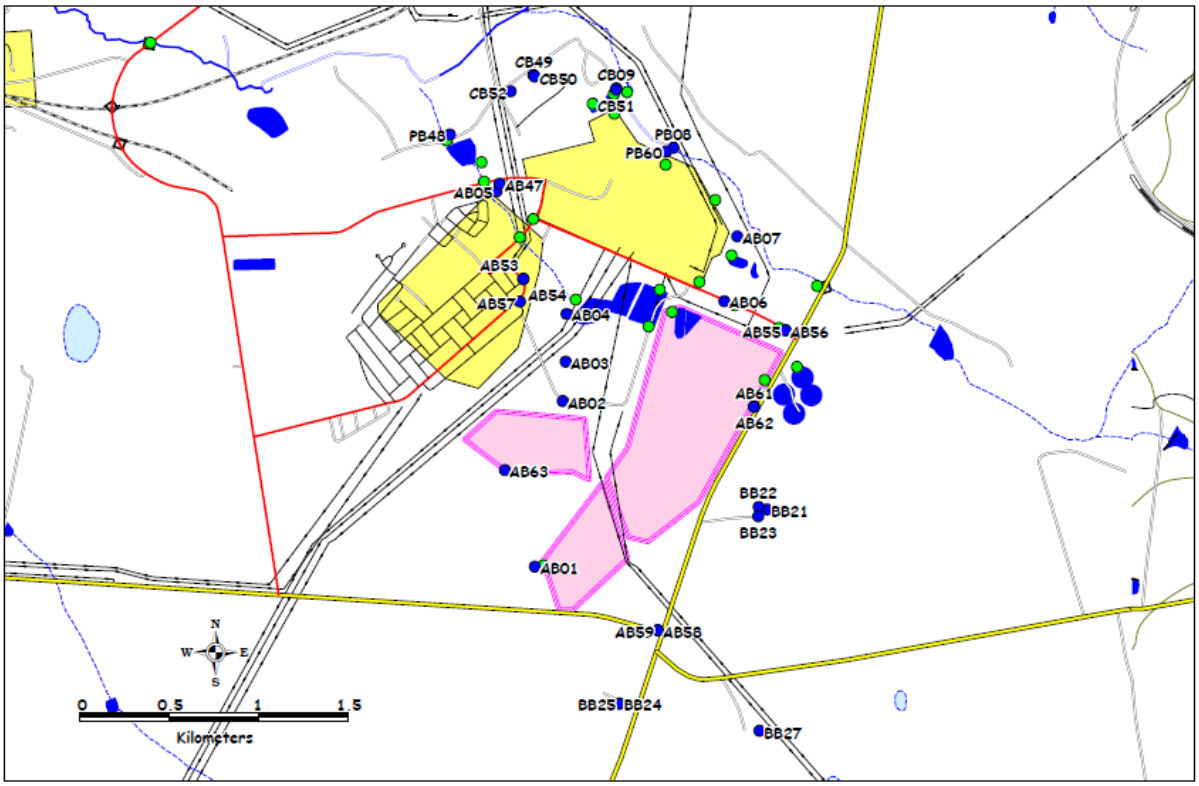


Figure 20: Groundwater sampling sites used for quarterly monitoring

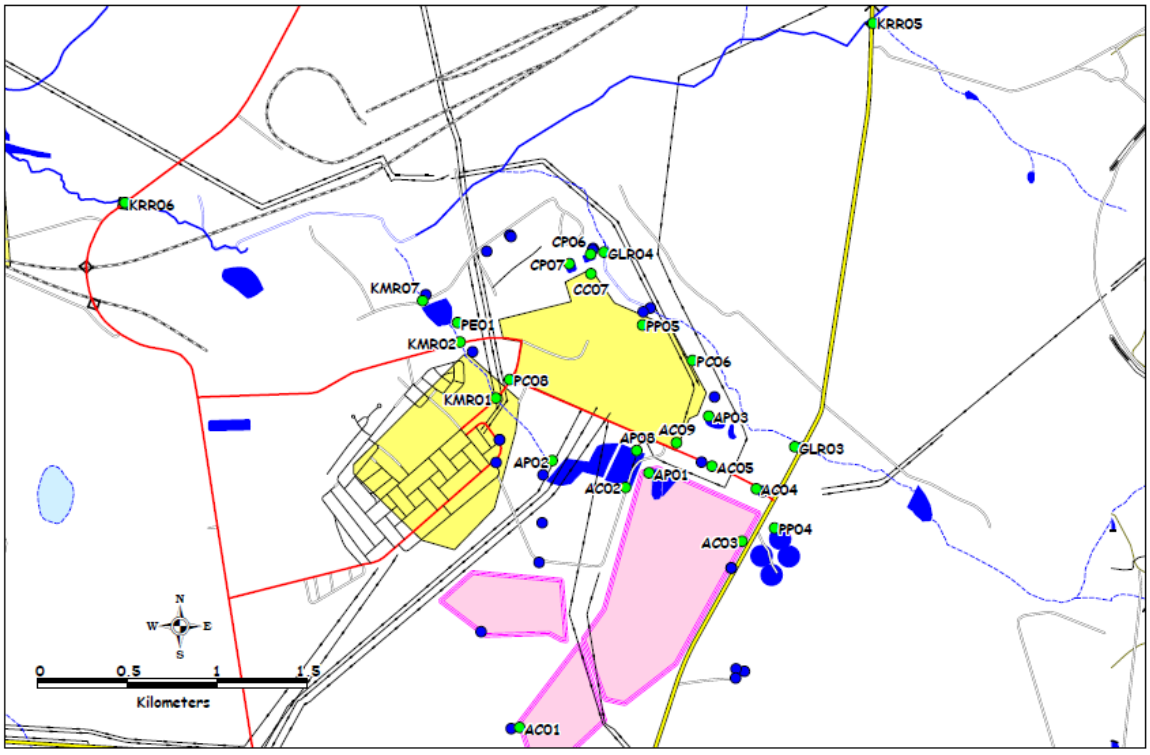


Figure 21: Surface water sampling sites used for quarterly monitoring

Contamination of surface and ground water from the coal stockyard through runoff and infiltration can be expected to result in high levels of sulphate, calcium, iron, manganese, aluminium and salts, and low pH.

Monitoring data shows high levels of sulphate and manganese in the areas surrounding the coal stockyard and 3rd recovery dam in both surface and groundwater. The trend seems however to be one of decreasing concentrations over time. Electrical Conductivity and pH levels were situated within an acceptable range (van Niekerk and van Wyk, 2009, van Niekerk and Moolman, 2010a and b, van Niekerk and Groenewald, 2010c, 2011a, b and c, 2012a and b).

Electrical Conductivity measured since 2009 in the ashing area was found to be within an acceptable range, suggesting that brine discharge to the Ash Water Return dam is not causing any significant contamination of the groundwater.

The 3rd recovery dam has had several incidents of spillages that were reported to the Water Affairs Regional office and recorded in terms of the power station's management system requirements.

While water contamination is evident, it is not possible to determine with certainty the source of the impacts.

The water quality data is also not conclusive regarding pH and salinity, as the monitoring results in this regard differ vastly from the data obtained by the specialist as part of the wetland and aquatic study (**Table 2**). It is therefore recommended that the monitoring methodology and programme be reviewed to ensure the accuracy and relevance of the data provided. Detailed recommendations in this regard are provided in the EMP.

Table 2 shows the results of water quality sampling done in July 2012 on the watercourse in the vicinity of the haul road and coal stockyard. It revealed that there was a significant change (57,9%) in pH from the upstream to the downstream site, which was of serious concern. Electrical Conductivity (EC) measured between the upstream and downstream site increased by 77.24%. Finally the upstream site showed significantly low levels of dissolved oxygen in the water, indicating that oxygen levels are depleted through biological processes. These low levels of oxygen would not be sufficient to sustain all but the most tolerant aquatic species. (See **Section 9.1.1**)

Table 2: Water quality data for toxicological monitoring points (van Staden, 2012)

Site	Description	pH	Conductivity	DO
KPS1	Upstream of coal stockyard	7.60	277.7 mS/m	1.65 mg/L
KPS2	Downstream of coal stockyard	3.20	492.2 mS/m	7.83 mg/L

11.4 WASTE MANAGEMENT AND HAZARDOUS SUBSTANCES

Building rubble generated by construction of the various activities was collected by a designated service provider and disposed of at the Kriel waste site (registered waste disposal site).

The operation of the various activities does not result in any solid waste. Operation of the desalination plant and portable RO plant however generates brine which is discharged on the ash water return dam.

All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).

Spillages and leaks can occur during the storage and handling of hazardous substances required for the operation of the desalination plant and portable RO plant. The chemicals that are stored in the chemical storage building are bunded for containment of spillages and the bunds are suitably sized to contain 110% of the contents that are stored within the bunded area. Each bund drain in the building is

equipped with an isolating valve and the bunds can be drained individually to the neutralization sump.

Bunds are evaluated regularly and repaired where necessary to ensure integrity of the equipment. The chemicals are transferred from the storage facilities into the day tanks (dosing tanks) on the plant. Chemical handling and management at the power station is undertaken in accordance with relevant Eskom procedures including *CFG04 Sulphuric acid transfer line to portable Reverse Osmosis (RO) plant* (2011) and *Safe Working Procedure for offloading Bulk Sulphuric Acid at East Cooling Water* (2012).

The dosing tanks are bunded for containment of spillages and spillages are pumped out into suitable containers and dumped in the neutralization sump. Groundwater and surface water monitoring is regularly conducted (see **Section 10.3**).

11.5 HEALTH AND SAFETY

Operations at the power station present potential risks for the health and safety of workers on site. The handling of dangerous substances and the operation of equipment for instance present risks that should be prevented and managed adequately in order to ensure the health and safety of workers on site. Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies. The training programmes and operational procedures also cover the health and safety aspects related to emergency situations.

In line with the above, new staff members undergo induction and awareness training to sensitize them about the environmental, health and safety risks on site, as well as familiarise them with any relevant compliance related requirements and procedures (e.g. environmental authorisations' conditions, Environmental Management Programmes etc.).

11.6 TRAFFIC

With the haul road and coal stockyard upgrades, there are large quantities of coal transported to the station by truck (approximately 556 trucks/day with 27 ton load capacity each, 1 truck every 2-3 min). As a result, traffic volumes have increased on the road network surrounding the power station (especially R35), which is likely to have caused negative impacts on traffic patterns, as well as increased road maintenance requirements.

The additional traffic also causes air pollution (dust and gas emissions) and may negatively impact on the safety of other road users.

11.7 NOISE

Sources of noise include the operation of the desalination plant and the portable RO plant, operations at the coal stockyard, and trucks travelling to and from the power station.

The main noise receptor is Komati village, which is situated relatively far from the above-mentioned sources of noise (the closest household is situated approximately 800 m from the coal stockyard and 1 km from the haul road), and is not expected to be adversely impacted by the activities.

Contractors and staff working in the power station may be affected by the changes in noise regime to some extent. Noise levels from the operation of the desalination plant (which is located within a building) and the portable RO plant are relatively low. In addition, both are located within the power station and, combined, have a relatively marginal impact on noise levels, in comparison to the more noisy activities which take place at the power station. They may however have a cumulative impact and affect workers on site.

Operations at the coal stockyard and trucks travelling to and from the power station are likely to involve higher noise levels and may affect workers in the vicinity of these operations. The necessary preventative measures (e.g. ear protective equipment) are in place to ensure that exposure to high levels of noise does not compromise the health of workers on site.

There are some informal dwellings located between the R35 and the power station premises, on the power station property. They are in all likelihood the most affected by the noise and dust generated by the trucks supplying the power station.

Eskom will furthermore comply with the relevant SABS standards (i.e. SANS 10103:2008) on noise levels. The applicable noise levels for the power station are those for rural districts.

12. ASSESSMENT OF ENVIRONMENTAL IMPACTS

12.1 CONSTRUCTION PHASE

12.1.1 Haul Road

Government Notice No. R386 Activity No **1(m)** and **15**.

Table 3: Haul Road - Summary of Impacts during Construction Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Air Quality	Fugitive particulate emissions (dust) related to debris handling, truck transport, materials storage, handling and transfer. Vehicle exhaust emissions.	The sources of gaseous emissions that occur in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates, emitted from remote tall stacks and from large-scale biomass burning.	• Implementation of dust control measures and monitoring in accordance with Fugitive Emissions Management Plan (Eskom, 2010). • An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • See EMP.
Wetland and aquatic ecology	Construction of haul road and coal stockpile yard within 32 m buffer zone of adjacent wetland and associated movement of construction vehicles. Vehicles driving through sensitive wetland areas during construction may have cause the destruction and disturbance of natural	Many of the systems in the area have already been significantly impacted upon through increased sediment loads occurring in the systems. Impacts due to sedimentation can affect the biodiversity and functioning of the	• Works in or near the wetland areas was undertaken during the dry winter months (construction commenced in April 2007 and ended in August 2007). • Control activities directly impacting on wetland areas or water courses by restricting access to the rest of the wetland. • Rehabilitation / restoration of indigenous vegetative cover. • Alien plant control.

	Nature/description of impact	***Cumulative impacts***	***Comment/mitigation***
	habitat of animal and invertebrate species. Roads constructed have been re vegetated with Kikuyu grass (Invasive vegetation impact). (van Staden, 2012)	system. With disturbance of the soils associated with the activities, further sedimentation of the wetland systems may have occurred with possible loss of aquatic refugia as a result.	• If wetland soils are lifted and stored for re-use during rehabilitation, the layers must be lifted in sequence and clearly marked before careful storage in similar conditions as in-situ. Soils must be reinstated in the correct sequence during rehabilitation to ensure correct groundwater movement. • In terms of the EMS, no vehicle or machinery should have been refuelled on site except at a designated refuelling area. • In terms of the EMS, no oil or lubricant changes or repairs should have been made on site other that at designated workshop areas. • Measures to prevent and manage the occurrence of oil leaks or fuel spills are included in the Eskom Directive (ESKADABG8) and Standard (ESKASABT0) relating to oil spill cleanup and rehabilitation. • Erosion occurring on the land under Komati Power Station's control has been and will continue to be identified, rehabilitated and monitored as part of the relevant environmental management requirements.
	Contamination of wetland areas by dirty water and harmful chemicals due to spillages from construction vehicles and presence of construction materials. Seepage has the potential to contaminate the groundwater environment, which in turn can affect water quality in surface water sources in the area.		
	Ineffective rehabilitation of disturbed wetland areas could cause siltation, erosion and changes in the hydrological functioning of these areas.		
	Destruction of the wetland areas may lead to a loss of ecological services in terms of habitat provision, nutrient trapping, flood control and water purification among others.		
	Building activities that disturb the natural landscape and increased soil runoff increase sediment loads in streams and wetland and disturb aquatic ecosystems. Increased sediment loads may lead to floods if channels become filled with sediment.		
	Impact on overall faunal biodiversity and migratory corridors due to destruction of habitat and construction of the haul road.		
	Impact on aquatic community sensitivity and diversity due to alteration of natural habitat units through the construction of the haul		

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
	road in the wetland buffer zone along with the adjacent stockpile introduction of alien plant species, loss of natural habitat and sensitive aquatic invertebrate species and loss of amphibian species relying on the wetlands natural habitat.		
Waste Management	Pollution due to improper handling, storage and disposal of construction waste.	-	Construction waste was disposed of at an approved municipal dump site (Kriel Waste Disposal Site). All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
Health and Safety	Construction activities present inherent risks to the health and safety of workers on site.	-	No reported incidents during the construction phase. Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies.
Traffic	Increased traffic on the R35 due to the transport of building materials, and construction workers from surrounding areas.	Increased traffic volumes leading to congestion and a decrease in road safety on the road network surrounding the power station.	
Noise Pollution	Nuisance due to noise from construction vehicles and construction activities.	-	There are no noise sensitive areas in close proximity of the site.
Cultural/Heritage	Damage or loss of cultural and/or heritage resources due to construction activities.	-	No cultural/heritage resources have been found on or near site.
Water quality	Contamination of water resources through litter, spills and leaks.		Waste disposal, spills and leaks are controlled in terms of the power station's EMS.

Table 4: Haul Road - Construction Phase Impact Assessment

Haul Road – Construction Phase												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air quality												
Fugitive particulate emissions (dust) related to construction activities	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Low	High	Medium	Low
Construction vehicle gas emissions.	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Medium	High	Medium	Low
Wetland Related Impacts												
Encroachment by haul road	Regional	Long term	High	High	Medium	Medium-high	Local	Long term	Medium	High	Medium	Medium Low
Seepage of dirty water	Regional	Long term	High	High	Medium	Medium High	Regional	Long term	Medium	Medium	Medium	Medium Low
Vehicles entering sensitive areas	Regional	Long term	High	High	Medium	Medium High	Local	Long term	Medium	High	Medium	Medium Low
Ineffective rehabilitation	Regional	Long term	High	High	Medium	Medium High	Regional	Medium term	Medium	Medium	Medium	Medium Low
Loss of ecological services	Regional	Long term	High	High	Medium	High	Regional	Long term	Medium	High	Medium	Medium Low
Impacts due to sedimentation and erosion	Regional	Long term	High	High	Medium	High	Regional	Long term	Medium	High	Medium	Medium Low
Impact on overall faunal biodiversity due to impact on habitat and migratory corridors	Regional	Long term	High	High	Medium	Medium High	Local	Long term	Medium	Medium	Medium	Medium Low
Impact on aquatic community, sensitivity and diversity	Regional	Long term	High	High	Medium	High	Regional	Long Term	Medium	High	Medium	Medium Low

Haul Road – Construction Phase												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Waste management												
Soil/water/air pollution due to improper waste handling, storage and disposal	Local	Long term	Medium - high	Medium	Medium	Medium	Local	Short term	Medium - high	Low	Medium	Low
Health and safety												
Health and safety hazards	Local	Short term	High	Medium	Medium	Medium	Local	Short term	Low	Low	Medium	Low
Traffic												
Increased traffic on the R35	Regional	Short term	Medium	High	Low	Medium	Regional	Short term	Medium	High	Low	Medium
Noise												
Nuisance	Local	Short term	Medium-high	Medium	Medium	Low	Local	Short term	Medium	Low	Medium	Low
Water quality												
Contamination of water resources through litter, spills and leaks	Regional	Short term	High	Medium	Medium	Medium	Local	Short term	High	Low	Medium	Low
Cultural/Heritage												
Damage or loss of cultural and/or heritage resources due to construction activities.	Local	Short term	Low	Low	High	Low						

12.1.2 Coal Stockyard

Government Notice No. R386 Activity No **1(m) and 1(k)**.

Table 5: Coal Stockyard - Summary of Impacts during Construction Phase

	Nature/description of impact	***Cumulative impacts***	***Comment/mitigation***
Air quality	Fugitive particulate emissions (dust) related to debris handling, truck transport, materials storage, handling and transfer. Vehicle exhaust emissions.	The sources of gaseous emissions that occur in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates, emitted from remote tall stacks and from large-scale biomass burning.	• Dust suppression is applied on the coal stockyard surface. • Implementation of dust control measures and monitoring in accordance with Fugitive Emissions Management Plan (Eskom, 2010). • An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • See EMP.
Wetland and Aquatic	Construction of coal stockyard in 32 m buffer zone of adjacent wetland leading to disturbance of wetland.	Many of the systems in the area have already been significantly impacted	• Control activities directly impacting on wetland areas or water courses by restricting access to the rest of the

	Nature/description of impact	***Cumulative impacts***	***Comment/mitigation***
	Contamination of wetland areas by dirty water and harmful chemicals due to spillages from construction vehicles and presence of construction materials. Seepage has the potential to contaminate the groundwater environment, which in turn can affect water quality in surface water sources in the area.		
	Ineffective rehabilitation of disturbed wetland areas could cause siltation, erosion and changes in the hydrological functioning of these areas.		
	Destruction of the wetland areas may lead to a loss of ecological services in terms of habitat provision, nutrient trapping, flood control and water purification among others.		
	Building activities that disturb the natural landscape and increased soil runoff increase sediment loads in streams and wetland and disturb aquatic ecosystems. Increased sediment loads may lead to floods if channels become filled with sediment.		
	Impact on overall faunal biodiversity and migratory corridors due to destruction of habitat and construction of the coal stockyard.		
	Impact on aquatic community sensitivity and diversity due to alteration of natural habitat units through the construction of the coal stockyard in the wetland buffer zone, introduction of alien plant species, loss of natural habitat and sensitive aquatic invertebrate species and loss of amphibian species relying on the wetlands natural habitat.		

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Waste Management	Pollution due to improper handling, storage and disposal of construction waste.		Construction waste was disposed of at an approved municipal dump site (Kriel Waste Disposal Site). All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
Health and Safety	Construction activities present inherent risks to the health and safety of workers on site.		No reported incidents during the construction phase. Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies.
Traffic	Increased traffic on the R35 due to the transport of building materials, and construction workers from surrounding areas.	Increased traffic volumes leading to congestion and a decrease in road safety on the road network surrounding the power station.	
Noise	Nuisance due to noise from construction vehicles and construction activities.	-	There are no noise sensitive areas in close proximity of the site.
Cultural/Heritage	Damage or loss of cultural and/or heritage resources due to construction activities.	-	No cultural/heritage resources have been found on or near site.
Water quality	Contamination of water resources through litter, spills and leaks.		Waste disposal, spills and leaks are controlled in terms of the power station's EMS.

Table 6: Coal Stockyard - Construction Phase Impact Assessment

Coal Stockyard Construction Phase – Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air Quality												
Fugitive particulate emissions (dust) related to construction activities	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Low	High	Medium	Low
Construction vehicle gas emissions.	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Medium	High	Medium	Low
Wetland and aquatic ecology												
Encroachment by haul road	Regional	Long term	High	High	Medium	Medium-high	Local	Long term	Medium	High	Medium	Medium - Low
Seepage of dirty water	Regional	Long term	High	High	Medium	Medium High	Regional	Long term	Medium	Medium	Medium	Medium Low
Vehicles entering sensitive areas	Regional	Long term	High	High	Medium	Medium High	Local	Long term	Medium	High	Medium	Medium Low
Ineffective rehabilitation	Regional	Long term	High	High	Medium	Medium High	Regional	Medium term	Medium	Medium	Medium	Medium Low
Loss of ecological services	Regional	Long term	High	High	Medium	High	Regional	Long term	Medium	High	Medium	Medium Low
Impacts due to sedimentation and erosion	Regional	Long term	High	High	Medium	High	Regional	Long term	Medium	High	Medium	Medium Low
Impact on overall faunal biodiversity due to impact on habitat and migratory corridors	Regional	Long term	High	High	Medium	Medium High	Local	Long term	Medium	Medium	Medium	Medium Low

Coal Stockyard Construction Phase – Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Waste management												
Soil/water/air pollution due to improper waste handling, storage and disposal	Local	Long term	Medium - high	Medium	Medium	Medium	Local	Short term	Medium - high	Low	Medium	Low
Health and safety												
Health and safety hazards	Local	Short term	High	Medium	Medium	Medium	Local	Short term	Low	Low	Medium	Low
Traffic												
Increased traffic on the R35	Regional	Short term	Medium	High	Low	Medium	Regional	Short term	Medium	High	Low	Medium
Noise												
Nuisance	Local	Short term	Medium-high	Medium	Medium	Low	Local	Short term	Medium	Low	Medium	Low
Water quality												
Contamination of water resources through litter, spills and leaks	Regional	Short term	High	Medium	Medium	Medium	Local	Short term	High	Low	Medium	Low
Cultural/Heritage												
Damage or loss of cultural and/or heritage resources due to construction activities.	Local	Short term	Low	Low	High	Low						

12.1.3 Third Recovery Dam

Government Notice No. R386 Activity No **1(n)**.

Table 7: Recovery Dam - Summary of Impacts during Construction Phase

	Nature/description of impact	***Cumulative impacts***	***Comment/mitigation***
Air quality	Fugitive particulate emissions (dust) related to debris handling, truck transport, materials storage, handling and transfer. Vehicle exhaust emissions.	The sources of gaseous emissions that occur in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates, emitted from remote tall stacks and from large-scale biomass burning.	• Implementation of dust control measures and monitoring in accordance with Fugitive Emissions Management Plan (Eskom, 2010). • An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • See EMP.
Soil erosion and sedimentation	Disturbance of soil surface. Changes in runoff characteristics. Artificial infilling (affecting water distribution).	-	Erosion occurring on the land under Komati Power Station's control has been and will continue to be identified, rehabilitated and monitored as part of the relevant environmental management requirements.
Waste management	Pollution due to improper handling, storage and disposal of construction waste.	-	Construction waste was disposed of at an approved municipal dump site (Kriel Waste Disposal Site). All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
Health and Safety	Construction activities present inherent risks to the health and safety of workers on site.	-	No reported incidents during the construction phase. Eskom has developed and is implementing training programmes and procedures to prevent and manage

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
			risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies.
Traffic	Increased traffic on the R35 due to the transport of building materials, and construction workers from surrounding areas.	Increased traffic volumes leading to congestion and a decrease in road safety on the road network surrounding the power station.	
Noise	Nuisance due to noise from construction vehicles and construction activities.		There are no noise sensitive areas in close proximity of the site.
Cultural/Heritage	Damage or loss of cultural and/or heritage resources due to construction activities.		No cultural/heritage resources have been found on or near site.
Water quality	Contamination of water resources through litter, spills and leaks.		Waste disposal, spills and leaks are controlled in terms of the power station's EMS.

Table 8: Third Recovery Dam - Construction Phase Impact Assessment

Third Recovery Dam – Construction phase Impact Assessment												
	Pre-mitigation						**Post-mitigation**					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air Quality												
Fugitive particulate emissions (dust) related to construction activities	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Low	High	Medium	Low
Construction vehicle gas emissions.	Regional	Short term	Medium	High	Medium	Medium	Regional	Short term	Medium	High	Medium	Low
Soil erosion and sedimentation												
Disturbance of soil surface, sedimentation and erosion	Local	Short term	Medium	Medium	Medium	Medium	Local	Short term	Medium	Low	Medium	Low

Third Recovery Dam – Construction phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Waste management												
Soil/water/air pollution due to improper waste handling, storage and disposal	Local	Long term	Medium - high	Medium	Medium	Medium	Local	Short term	Medium - high	Low	Medium	Low
Health and safety												
Health and safety hazards	Local	Short term	High	Medium	Medium	Medium	Local	Short term	Low	Low	Medium	Low
Traffic												
Increased traffic on the R35	Regional	Short term	Medium	High	Low	Medium	Regional	Short term	Medium	High	Low	Medium
Noise												
Nuisance	Local	Short term	Medium-high	Medium	Medium	Low	Local	Short term	Medium	Low	Medium	Low
Water quality												
Contamination of water resources through litter, spills and leaks	Regional	Short term	High	Medium	Medium	Medium	Local	Short term	High	Low	Medium	Low
Cultural/Heritage												
Damage or loss of cultural and/or heritage resources due to construction activities.	Local	Short term	Low	Low	High	Low						

12.1.4 Desalination Plant

Government Notice No. R387 Activity No **1(p)**.

Table 9: Desalination Plant - Summary of Impacts during Construction Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Air quality	Fugitive particulate emissions (dust) related to debris handling, truck transport, materials storage, handling and transfer. Vehicle exhaust emissions.	The sources of gaseous emissions that occur in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates, emitted from remote tall stacks and from large-scale biomass burning.	• Implementation of dust control measures and monitoring in accordance with Fugitive Emissions Management Plan (Eskom, 2010). • An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • See EMP.
Waste management	Pollution due to improper handling, storage and disposal of construction waste.	-	Construction waste was disposed of at an approved municipal dump site (Kriel Waste Disposal Site). All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
Health and Safety	Construction activities present inherent risks to the health and safety of workers on site.	-	No reported incidents occurred during the construction phase. Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
			Eskom's health, safety and environmental policies.
Traffic	Increased traffic on the R35 due to the transport of building materials, and construction workers from surrounding areas.	Increased traffic volumes leading to congestion and a decrease in road safety on the road network surrounding the power station.	
Noise Pollution	Nuisance due to noise from construction vehicles and construction activities.		There are no noise sensitive areas in close proximity of the site.

Table 10: Desalination Plant - Construction Phase Impact Assessment

Desalination Plant – Construction Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air Quality												
Fugitive particulate emissions (dust) related to construction activities	Regional	Short term	Low	Medium	Medium	Low						
Construction vehicle gas emissions.	Regional	Short term	Low	High	Medium	Medium	Regional	Short term	Low	High	Medium	Low
Waste management												
Soil/water/air pollution due to improper waste handling, storage and disposal	Local	Long term	Medium - high	Medium	Medium	Medium	Local	Short term	Medium-high	Low	Medium	Low
Health and safety												
Health and safety hazards	Local	Short term	High	Medium	Medium	Medium	Local	Short term	Low	Low	Medium	Low
Traffic												
Increased traffic on the R35	Regional	Short term	Low	High	Medium	Low						
Noise												
Nuisance	Local	Short term	Low	Medium	Medium	Low						

12.1.5 Portable RO Plant

Government Notice No. 718 List of Waste Management Activity No **4(7)**.

Table 11: Portable RO Plant - Summary of Impacts during Construction Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Air quality	Fugitive particulate emissions (dust) related to debris handling, truck transport, materials storage, handling and transfer. Vehicle exhaust emissions.	Sources of gaseous emissions in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates emitted from remote tall stacks and from large-scale biomass burning.	• Implementation of dust control measures and monitoring in accordance with Fugitive Emissions Management Plan (Eskom, 2010). • An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • See EMP.
Waste management	Pollution due to improper handling, storage and disposal of construction waste.	-	Construction waste was disposed of at an approved municipal dump site (Kriel Waste Disposal Site). All waste generated at the power station (i.e. liquid and solid waste, general and hazardous) is managed in accordance with Eskom's Waste Management Procedure EPC 32-245 (Eskom, 2009).
Health and Safety	Construction activities present inherent risks to the health and safety of workers on site.	-	No reported incidents occurred during the construction phase. Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies.
Traffic	Increased traffic on the R35 due to the transport of building materials, and construction workers from surrounding areas.	Increased traffic volumes leading to congestion and a decrease in road safety on the road network surrounding the power station.	
Noise	Nuisance due to noise from construction vehicles and construction activities.		There are no noise sensitive areas in close proximity of the site.

Table 12: Portable RO Plant - Construction Phase Impact Assessment

Portable RO Plant – Construction Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air Quality												
Fugitive particulate emissions (dust) related to construction activities	Regional	Short term	Low	Medium	Medium	Low						
Construction vehicle gas emissions.	Regional	Short term	Low	High	Medium	Medium	Regional	Short term	Low	High	Medium	Low
Waste management												
Soil/water/air pollution due to improper waste handling, storage and disposal	Local	Long term	Medium-high	Medium	Medium	Medium	Local	Short term	Medium - high	Low	Medium	Low
Health and safety												
Health and safety hazards	Local	Short term	High	Medium	Medium	Medium	Local	Short term	Low	Low	Medium	Low
Traffic												
Increased traffic on the R35	Regional	Short term	Low	High	Medium	Low						
Noise												
Nuisance	Local	Short term	Low	Medium	Medium	Low						

12.2 OPERATIONAL PHASE

12.2.1 Haul Road

Government Notice No. R386 Activity No **1(m)** and **15**.

Table 13: Haul Road - Summary of Impacts during Operational Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Air quality	Vehicle exhaust emissions and dust from transportation vehicles travelling on haul road.	Sources of gaseous emissions in the region include industrial activities (power stations and mining operations), veld fires, vehicle exhaust emissions, agriculture and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates emitted from remote tall stacks and from large-scale biomass burning.	• An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • Dust control measures and monitoring (see EMP).
Wetland Related Impacts	Vehicles may impact upon sensitive wetland areas during operation, resulting in erosion and sedimentation of wetlands; spillages of coal dust and contaminated sediment into wetland; compaction impact on soils; and the dewatering of the wetland. Further operational waste materials into wetland areas could occur and would affect the habitat integrity of these areas.	Many of the systems in the area have already been significantly impacted upon through increased sediment loads occurring in the systems.	• Road use should be confined. • No vehicles/access allowed in wetland area. • No further encroachment into wetland area allowed. • No oil or lubricant changes or repairs are made on site other that at designated workshop areas.
	Ineffective rehabilitation of disturbed wetland areas could cause siltation, erosion and changes in the hydrological functioning of these areas.	Impacts due to sedimentation can be significant and have the potential to affect the biodiversity and functioning of the system. With disturbance of the soils associated with the project, there is a risk of	• Measures are 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.
	Destruction/degradation of the wetland areas may lead to a loss of ecological services in terms of habitat		

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
	provision, nutrient trapping, flood control and water purification among others.	sedimentation of the wetland systems and the possible loss of aquatic refugia	• Maintenance of buffer zone to trap sediments with associated toxins. • Immediate cleaning of any spills into the wetland or stormwater system with appropriate methods • See EMP
	The haul road activity may disturb the natural landscape and increase sediment loads to streams and disturb the aquatic environment. This will cause streams, rivers and wetland areas to become filled with excess sediment. Increased sediment loads may lead to floods if channels become filled with sediment.		
	The haul road may impact on stream continuity leading to the alteration of natural habitat units and the introduction of alien plant species. Heavy vehicle movement may lead to the loss of natural habitat, sensitive aquatic invertebrates species and amphibian species relying on the wetland natural habitat. Many sensitive aquatic invertebrate species are often the first to be lost in situations where their habitat has been impacted on. Other aquatic species or amphibian species may be lost due to a habitat loss.		
Water quality	Seepage of dirty water containing coal residue and the ineffective separation of clean and dirty water systems may occur.	Seepage from power station facilities, general dirty water areas as well as spillages of hydrocarbons has the potential to contaminate the groundwater environment, which in turn can affect water quality in surface water sources in the area.	A double drainage system effectively prevents the mixing of clean and dirty water.
Traffic	Traffic on road network surrounding the power station due to coal supply by truck may impact on level of service of affected roads.		Appropriate signage is placed. Traffic calming measures include speed bumps, speed limits, construction of turning lanes off the R35, and truck traffic is limited to daylight hours. Measures to prevent overloading of trucks.
Noise	Noise from trucks.	Noise from power station operations.	Relevant SABS standards are adhered to.
Health and safety	Health and safety hazards related to traffic on the haul road.		See traffic related mitigation measures.

Table 14: Haul Road - Operational Phase Impact Assessment

Haul Road – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air Quality												
Particulate emissions (especially coal dust)	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium
Vehicle exhaust emissions	Regional	Long term	Medium	High	High	Medium	Regional	Long term	Medium	High	High	Medium
Wetland Related Impacts												
Encroachment by haul road	Regional	Long term	High	High	High	Medium-high	Local	Long term	Medium	High	High	Medium - Low
Seepage of dirty water	Regional	Long term	High	High	High	Medium High	Regional	Long term	Medium	Medium	High	Medium Low
Ineffective rehabilitation	Regional	Long term	High	High	High	Medium High	Regional	Medium term	Medium	Medium	High	Medium Low
Loss of ecological services	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium Low
Impacts due to sedimentation and erosion	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium Low
Impact on overall faunal biodiversity due to impact on habitat and migratory corridors	Regional	Long term	High	High	High	Medium High	Local	Long term	Medium	Medium	High	Medium Low
Impact on aquatic community, sensitivity and diversity	Regional	Long term	High	High	High	High	Regional	Long Term	Medium	High	High	Medium Low

Haul Road – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Health and safety												
Safety hazards	Local	Long term	High	Medium	High	Medium	Local	Long term	High	Low	High	Low
Road safety decrease on affected roads due to coal supply by truck	Regional	Long term	Medium	High	Low	Medium	Regional	Long term	Medium	High	Low	Medium
Traffic												
Lower level of service of affected roads due to coal supply by truck	Regional	Long term	Medium	High	Low	Medium	Regional	Long term	Medium	High	Low	Medium – low
Noise												
Nuisance due to trucks travelling on haul road	Local	Long term	Medium	High	Medium	Medium	Local	Long term	Low	High	Medium	Low
Water quality												
Contamination of water resources	Regional	Long term	Medium	Medium	Medium	Medium	Local	Long term	Low	Low	Medium	Low

12.2.2 Coal Stockyard

Government Notice No. R386 Activity No **1(m) and 1(k)**.

Table 15: Coal Stockyard - Summary of Impacts during Operational Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Air quality	Coal dust related to operational activities.	Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region (e.g wind erosion from exposed areas, fugitive dust from agricultural operations, vehicle entrainment from roadways and veld burning, particulates, emitted from remote tall stacks and from large-scale biomass burning.	• An ambient air quality monitoring station has been established approximately 2.2 kilometres south west of the designated coal stockpile area. The station monitors PM10 concentrations and relevant meteorological data including wind speed and direction. • Dust suppression applied on the coal stockyard surface is carried out every 3 hours. Dust suppression applied between coal stockyard and weigh bridge/truck tabolin carried out every 3 hours. • During offloading there is potential for coal dust emissions. Due to the limited capacity of the coal stock yard, compacting of seasonal coal and emergency coal is taking place.
Wetland related impacts	Vehicles may impact upon sensitive wetland areas during operation, resulting in erosion and sedimentation of wetlands; spillages of coal dust and contaminated sediment into wetland; compaction impact on soils; and the dewatering of the wetland. Further operational waste materials into wetland areas could occur and would affect the habitat integrity of these areas. Seepage of dirty water containing coal residue into wetland and the ineffective separation of clean and dirty water systems may occur. Seepage from power station facilities, general dirty water areas as well as spillages of hydrocarbons has the potential to contaminate the groundwater environment, which in turn can affect water quality	Many of the systems in the area have already been significantly impacted upon through increased sediment loads occurring in the systems. Impacts due to sedimentation can affect the biodiversity and functioning of the system. With disturbance of the soils associated with the activities, further sedimentation of the wetland systems may have occurred with possible loss of aquatic refugia as a result.	• The entire coal stockpile yard platform was rebuilt and lined with an impermeable clay layer approximately 400 mm thick in order to prevent contaminated water to enter the natural ground water system; and polluted water channels were constructed in order to contain polluted rainwater runoff from the coal stockpile. • The separation of clean storm water and dirty run-off from the coal stockpile is achieved by means of a double drainage system which will effectively prevent the mixing of clean and dirty water. • All industrial effluent and polluted storm water from the station terrace, including the coal stockpile drains area, are reticulated to the series of pollution dams. Any installed berms will be kept clean to prevent consequent contamination of groundwater. The dams operate at minimum level to prevent

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
	in surface water sources in the area.		over flow. • Groundwater monitoring will continue to assess the impact of the operation on the groundwater. The situation regarding the ash dams as a final depository of effluents will be monitored during this activity.
	Ineffective rehabilitation of disturbed wetland areas could cause siltation, erosion and changes in the hydrological functioning of these areas.		
	Destruction/degradation of the wetland areas may lead to a loss of ecological services in terms of habitat provision, nutrient trapping, flood control and water purification among others.		
	Operations at the coal stockyard may disturb the natural landscape and increase sediment loads to streams and disturb the aquatic environment. This will cause streams, rivers and wetland areas to become filled with excess sediment. Increased sediment loads may lead to floods if channels become filled with sediment.		
Water quality	Infiltration of dirty water containing coal residue from the coal stockyard to groundwater and the ineffective separation of clean and dirty water systems may cause surface and groundwater contamination.	Seepage from power station facilities, general dirty water areas as well as spillages of hydrocarbons has the potential to contaminate the groundwater environment, which in turn can affect water quality in surface water sources in the area.	• Upgrading of the coal stockpile yard included measures to prevent infiltration to groundwater such as a new engineered lining and seepage collection system. The entire coal stockpile yard platform was rebuilt and lined with an impermeable clay layer approximately 400 mm thick in order to prevent contaminated water to enter the natural ground water system • The separation of clean storm water and dirty run-off from the coal stockpile is achieved by means of a double drainage system which effectively prevents the mixing of clean and dirty water. All polluted storm water from the coal stockpile drains area are reticulated to a series of pollution dams (see **Figure 4**). • Any installed berms will be kept clean to prevent consequent contamination of groundwater. • Level indicators shall be installed at all dams and these will be monitored on a regular basis, especially after rains. • The dams will be operated at the lowest level practically

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
			achievable to ensure that sufficient buffer capacity is available to accommodate polluted effluent retention during emergency situations. • Groundwater monitoring will continue to assess the impact of the operation on the groundwater.
Noise	Noise related to operations at the coal stockyard	Noise from power station operations.	Relevant SABS standards are adhered to.
Health and safety	Health and safety hazards related to operations at the coal stockyard		Eskom has developed and is implementing training programmes and procedures to prevent and manage risks. This is done in accordance with the EMS in place as well as Eskom's health, safety and environmental policies.

Table 16: Coal Stockyard - Operational Phase Impact Assessment

Coal Stockyard – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Air quality												
Particulate emissions (especially coal dust)	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium
Vehicle exhaust emissions	Regional	Long term	Medium	High	High	Medium	Regional	Long term	Medium	High	High	Medium
Wetland Related Impacts												
Encroachment by haul road	Regional	Long term	High	High	High	Medium-high	Local	Long term	Medium	High	High	Medium – Low
Seepage of dirty water	Regional	Long term	High	High	High	Medium High	Regional	Long term	Medium	Medium	High	Medium Low
Ineffective rehabilitation	Regional	Long term	High	High	High	Medium High	Regional	Medium term	Medium	Medium	High	Medium Low
Loss of ecological services	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium Low
Impacts due to sedimentation and erosion	Regional	Long term	High	High	High	High	Regional	Long term	Medium	High	High	Medium Low
Impact on overall faunal biodiversity due to impact on habitat and migratory corridors	Regional	Long term	High	High	High	Medium High	Local	Long term	Medium	Medium	High	Medium Low
Impact on aquatic community, sensitivity and diversity	Regional	Long term	High	High	High	High	Regional	Long Term	Medium	High	High	Medium Low

Coal Stockyard – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Water quality												
Water contamination through polluted water runoff	Regional	Long term	High	High	Medium	High	Regional	Long term	High	Medium	Medium	Medium
Infiltration of dirty water to groundwater	Regional	Long term	High	Medium	Medium	Medium	Regional	Long term	High	Medium	Medium	Medium
Health and safety												
Safety hazards	Local	Long term	High	Medium	High	Medium	Local	Long term	High	Low	High	Low
Noise												
Noise related to stockyard operations	Local	Long term	Low	High	Medium	Low						

12.2.3 Third Recovery Dam

Government Notice No. R386 Activity No **1(n)**.

Table 17: Third Recovery Dam - Summary of Impacts during Operational Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Water quality	Spillages causing alteration of water quality.	Toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc) and hydrocarbons through runoff from road surfaces and discharge of solvents, and other industrial chemicals.	• Level indicators shall be installed at all dams and these will be monitored on a regular basis, especially after rains. • The dams are operated at the lowest level practically achievable to ensure that sufficient buffer capacity is available to accommodate polluted effluent retention during emergency situations. • Groundwater monitoring will continue to assess the impact of the operation on the groundwater.

Table 18: Third Recovery Dam - Operational Phase Impact Assessment

Third Recovery Dam – Operational Phase Impact Assessment												
	Pre-mitigation						**Post-mitigation**					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Water Quality												
Spillages causing alteration of water quality	Regional	Short term	Medium	Medium	Medium	Medium	Regional	Short term	Medium	Medium	Medium	Medium

12.2.4 Desalination Plant

Government Notice No. R387 Activity No **1(p)**.

Table 19: Desalination Plant - Summary of Impacts during Operational Phase

	Nature/description of impact	*Cumulative impacts*	*Comment/mitigation*
Waste management and hazardous substances	Spillages during the transport, storage and handling of chemicals.	-	• The vehicle service bay shall have an impermeable surface and a drainage system to capture all runoff. The runoff shall be directed to a sump with an oil separator, and residue oils shall be disposed of as hazardous. • In the event of a spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. • All site employees shall be made aware of the emergency procedure(s) to be followed for dealing with spills and leaks, which shall include notifying the responsible person and the relevant authorities. • Spill kits will be available on site, at the point of use, at all times and shall ensure that there is always an adequate supply of absorbent material available in the spill kits to absorb/ breakdown and, where possible, be designed to encapsulate minor spillage. The quantity of such materials shall be able to handle a minimum of 200 L of spillage. • Details of each spill shall be recorded in an on-site logbook. The details to be recorded include date and locality of spill, distance to the nearest river, stream or drainage line, type of material, estimated quantity of spill, contact details of the people involved, mitigation steps taken, measures that will be implemented to prevent a reoccurrence and results of any subsequent monitoring.
Water quality	Groundwater contamination through discharge of brine on ash water return dam.		• Groundwater monitoring will continue to assess the impact of the operation on the groundwater. The situation regarding the ash dams as a final depository of effluents (brine) will be monitored during this activity.
Health and safety	Hazards related to storage and handling of chemicals		• All site workers will undergo an environmental awareness training as part of their induction and ongoing training.

Table 20: Desalination Plant - Operational Phase Impact Assessment

Desalination Plant – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Waste management and hazardous substances												
Spillages related to transport, storage and handling of chemicals	Regional	Short term	High	Medium	Medium	High	Local	Short term	Medium	Low	High	Low
Water quality												
Groundwater contamination through discharge of brine on ash water return dam	Regional	Long term	High	Medium	Medium	Medium	Regional	Long term	Low	Medium	Medium	Low
Health and safety												
Hazards related to storage and handling of chemicals	Local	Long term	High	Medium	Medium	Medium	Local	Long term	Low	Low	Medium	Low

12.2.5 Portable RO Plant

Government Notice No. 718 List of Waste Management Activity No **4(7)**.

Table 21: Portable RO Plant - Summary of Impacts during Operational Phase

	Nature/description of impact	***Cumulative impacts***	***Comment/mitigation***
Waste management and hazardous substances	Spillages during the transport, storage and handling of chemicals.	-	• The vehicle service bay shall have an impermeable surface and a drainage system to capture all runoff. The runoff shall be directed to a sump with an oil separator, and residue oils shall be disposed of as hazardous. • In the event of a spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. • All site employees shall be made aware of the emergency procedure(s) to be followed for dealing with spills and leaks, which shall include notifying the responsible person and the relevant authorities. • Spill kits will be available on site, at the point of use, at all times and shall ensure that there is always an adequate supply of absorbent material available in the spill kits to absorb/ breakdown and, where possible, be designed to encapsulate minor spillage. The quantity of such materials shall be able to handle a minimum of 200 L of spillage. • Details of each spill shall be recorded in an on-site logbook. The details to be recorded include date and locality of spill, distance to the nearest river, stream or drainage line, type of material, estimated quantity of spill, contact details of the people involved, mitigation steps taken, measures that will be implemented to prevent a reoccurrence and results of any subsequent monitoring.
Water quality	Groundwater contamination through discharge of brine on ash water return dam.		• Groundwater monitoring will continue to assess the impact of the operation on the groundwater. The situation regarding the ash dams as a final depository of effluents (brine) will be monitored during this activity.
Health and safety	Hazards related to storage and handling of chemicals		• All site workers will undergo an environmental awareness training as part of their induction and ongoing training.

Table 22: Portable RO Plant - Operational Phase Impact Assessment

Portable RO Plant – Operational Phase Impact Assessment												
	Pre-mitigation						Post-mitigation					
Potential impact	Extent	Duration	Severity	Probability	Confidence	Significance	Extent	Duration	Severity	Probability	Confidence	Significance
Waste management and hazardous substances												
Spillages related to transport, storage and handling of chemicals	Regional	Short term	High	Medium	Medium	High	Local	Short term	Medium	Low	High	Low
Water quality												
Groundwater contamination through discharge of brine on ash water return dam	Regional	Long term	High	Medium	Medium	Medium	Regional	Long term	Low	Medium	Medium	Low
Health and safety												
Hazards related to storage and handling of chemicals	Local	Long term	High	Medium	Medium	Medium	Local	Long term	Low	Low	Medium	Low

13. ENVIRONMENTAL MANAGEMENT PROGRAMME

The draft EMP outlines how negative environmental impacts will be managed and minimised during operation. Recommendations are given with regard to the responsible parties for the implementation of the EMP.

Eskom Holdings will be required to comply with all current and future requirements as well as with the relevant conditions of permits / licences issued to Eskom.

Eskom also has its own requirements regarding the monitoring of certain aspects of the project such as effluent and air quality. These have been incorporated into the EMP.

Refer to **Appendix D: Draft EMP**.

14. ENVIRONMENTAL IMPACT STATEMENT

14.1 CONSTRUCTION RELATED IMPACTS

Impacts associated with the construction of the various activities applied for have been assessed based on information and records available. Findings from the environmental assessment show that traffic (related to transport of materials and equipment) was the most significant impact associated with construction and was rated as medium, with mitigation.

All other impacts were rated as medium-low or low, with mitigation. This is largely due to the fact that Komati Power Station has procedures and requirements in place, which have been implemented in terms of the Environmental Management System (EMS), relevant Environmental Management Programmes (EMPs), as well as Eskom's own policies regarding safety, health and environmental issues. It is assumed that the implementation of these procedures and requirements resulted in significant impacts being avoided, or mitigated.

14.2 OPERATION RELATED IMPACTS

Construction for all activities is complete. The most significant impacts associated with the operation of the listed activities applied for relate to air quality, water quality and wetland and aquatic ecology.

Air quality

Air quality impacts are mainly associated with the supply of coal by truck and coal handling operations at the coal stockyard. Particulate matter emissions are considered to be the main impact in that regard. Dust is regarded as a nuisance for neighbouring communities and has a negative impact on fauna and flora as well. Dust emissions associated with operations at the coal stockyard, and to a lesser extent, with truck traffic on the haul road, are high and exceed the daily limits set by the Standard laid out in the National Environment Management: Air Quality Act. Although the annual emissions are below the limits set by this standard, it is recommended that the existing Fugitive Emissions Management Plan be reinforced to include measures recommended by the air quality specialist (see EMP).

Water quality

Potential impacts on water quality are mainly associated with potential runoff from the coal stockyard, occasional spillages of the 3rd recovery dam, and discharge of brine on the ash water return dam.

Data obtained from the surface water quality monitoring reports (van Niekerk and van Wyk, 2009, van Niekerk and Moolman, 2010a and b, van Niekerk and Groenewald, 2010c, 2011a, b and c, 2012a and b) were at odds with the results from samples taken by the wetland and aquatic specialist regarding EC and pH. This discrepancy

did not allow for a conclusive statement to be made on water quality impacts and their significance. Impacts were therefore assessed conservatively.

There is evidence of surface and groundwater contamination in the areas around the coal stockyard and the 3rd recovery dam, although the source of the contamination is uncertain. According to the monitoring data, sulphate and manganese are the main pollutants in those areas. Impacts were rated as medium, as values for sulphate and manganese measured over the period 2009 to 2012 corresponded to classes 2 (marginal water quality), and to a lesser extent 3 (poor water quality), according to the DWA's *Quality of Domestic Water Supplies* (2nd Edition), 1998. Overall, a decreasing trend was identified for sulphate and manganese concentrations over the period, suggesting that mitigation of impacts and management of storm water and effluent at the power station has improved.

Results from the surface water quality sampling conducted by the wetland and aquatic ecology specialist however indicated that EC was very high and pH significantly acidic downstream of the coal stockyard. These impacts can potentially be attributable to runoff from the coal stockyard.

Based on results from the water quality monitoring, the discharge of brine on the ash water return dam has not caused any negative impacts on groundwater.

Due to uncertainty on water quality data, it is recommended that the methods used and the monitoring programme be reviewed in order to ensure that data obtained is accurate and provided in a format that allows Eskom to assess the effectiveness of mitigation measures implemented.

Wetland and aquatic ecology

The construction of the haul road and coal stockyard within the 32 m wetland buffer zone as well as seepage from power station facilities have had a negative impact on wetlands and the aquatic ecology of the system. Despite the water management measures in place (e.g. separation of clean and dirty water, lining of dams and coal stockyard), the toxicological data indicates that the activities adjacent to the wetland system are having a severe impact on the water quality within the system and are highly likely to impact on the aquatic ecology of the system. Implementation of additional mitigation measures is therefore recommended. A list of such measures is included in the EMP.

Traffic

The activities at Komati have also resulted in traffic impacts. Although the exact impact on the level of service and the condition of roads in the region, in particular the R35, has not been quantified, SANRAL has indicated that the R35 road was

being repaired and maintained on an ongoing basis, and that both the condition and level of service of the R35 were good.

Noise

The main sources of noise associated with the activities are related to coal stockyard operations and traffic on the haul road. Due to the absence of sensitive receptors in the vicinity of these operations, and existing mitigation, these impacts were rated as low.

Waste management, hazardous substances, health and safety

Impacts related to waste management, hazardous substances, and health and safety were not identified as significant impacts. This suggests that the waste management plan and health and safety procedures and training implemented at the power station are effective and sufficient to avoid and mitigate impacts.

15. CONCLUSIONS AND RECOMMENDATIONS

Some negative impacts have occurred as a result of the return to service of the power station in general, and as a result of the listed activities subject of this application in particular. These impacts have been mitigated to some extent and room exists to improve the management and mitigation of those impacts. Recommendations in this regard are included in the EMP.

The activities applied for have will result in positive impacts in the case of the water treatment facilities (desalination plant and portable RO plant). These facilities will greatly improve water and effluent management at the power station, and they are critical in bringing Komati in compliance with Eskom's ZLED requirements.

Besides improving water and effluent management, the main benefit of the activities is to maintain Komati Power Station operational, in an environmentally responsible manner. The power supply to the country is particularly stretched and Komati is a vital link in the power supply to the national grid. In order to assist the grid, and to minimise the use of gas turbines and other expensive base load generation or energy saving systems, Komati Power Station needs to run. All the activities subject to this rectification application are necessary to maintain the power station fully operational.

Should the activities not be allowed to continue, this will have a negative impact on the electrical grid and will lead to high input costs by running the diesel turbines, as well as load shedding.

It is therefore recommended that the activities applied for in this rectification application be granted environmental authorisation, subject to the implementation of additional mitigation measures as recommended in the draft EMP.

16. REFERENCES

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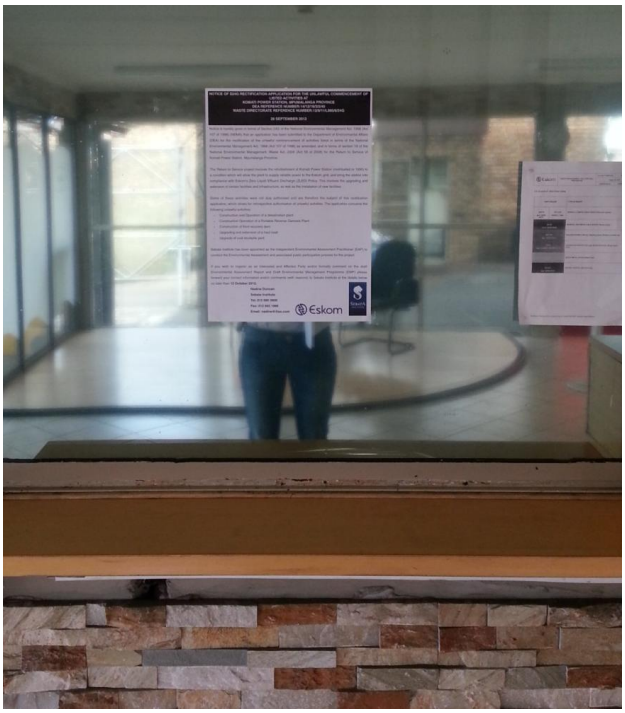
Van Schalkwyk, J. (2007). *Heritage Survey Report for the Komati Power Station Ash Dam Extension.*

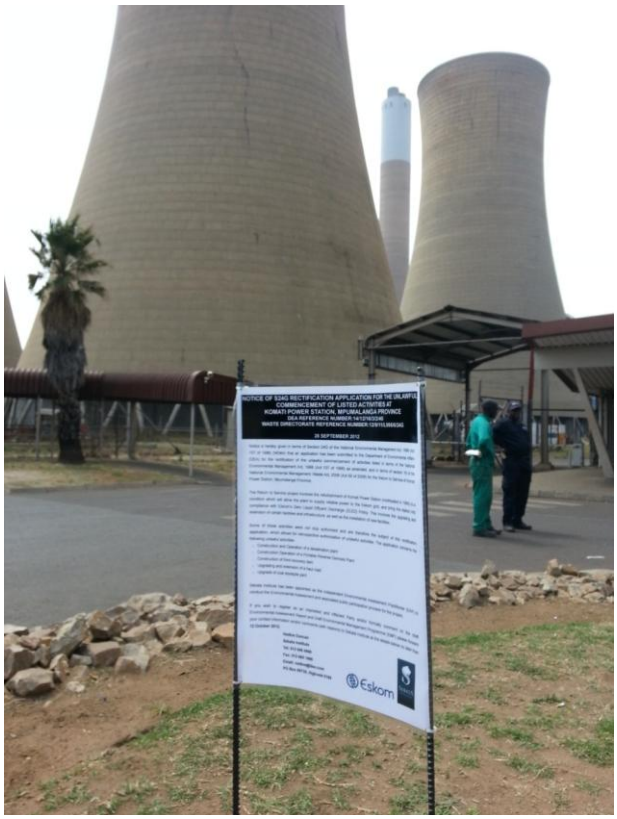
APPENDIX A: DEA REQUIREMENTS LETTER

APPENDIX B: PUBLIC PARTICIPATION INFORMATION

ADVERTISMENTS AND ON-SITE NOTICES

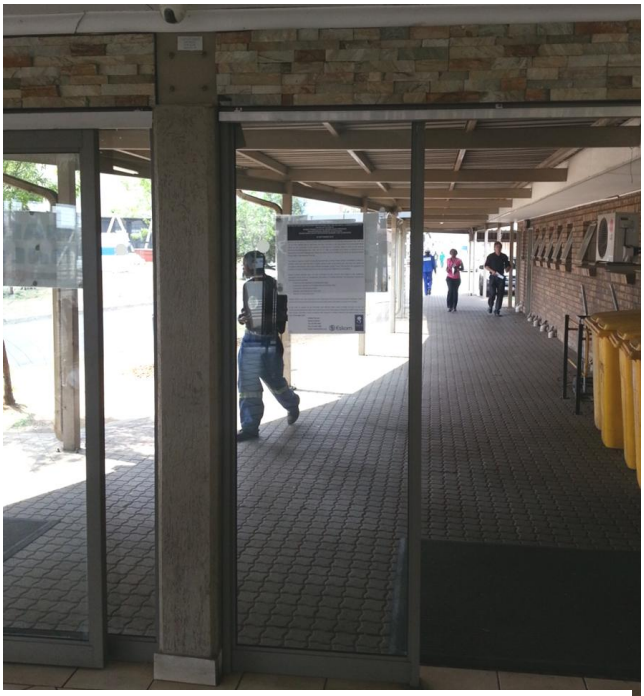


A3 notice at power station security desk



A2 notice at entrance to power station (parking area)

A2 notice at the Rec club in Komati village



A3 notice at pedestrian entrance to power station

A2 notice outside OK supermarket

BACKGROUND INFORMATION DOCUMENT

ISSUES AND RESPONSES REPORT

S24G APPLICATION: THE UNLAWFUL CONSTRUCTION AND OPERATION OF INFRASTRUCTURE AND FACILITIES AT KOMATI POWER STATION

Issues and Responses Report

Appendix to the Draft Environmental Impact Report

This report provides a formal and integrated record of all the issues raised by Interested and Affected Parties (I&APs) and the responses provided by the independent Environmental Assessment Practitioner up to 14 December 2012. It is presented as an Appendix to the Draft Environmental Impact Report. Copies of correspondence related to comments/issues have also been included in this Appendix.

Issue/Comment/Question	Date received	Origin	Response
1. The bulk of the coal that is transported to Komati derives from Schoongezicht mini-pit controlled by Anglo Coal. The process from the source to end the coal to be transported doesn't go well. As affected communities we need a clear explanation.	2012-11-05 By fax	PK Jacobs Schoongezicht Representing Committee (SRC)	Komati Power Station is not receiving any coal from Anglo Coal's Schoongezicht mini-pit at present. The trucks leaving Schoongezicht mini-pit are therefore supplying another user(s). All trucks supplying coal to the Komati Power Station are covered in order to reduce dust pollution. We have also included this as a requirement in the draft Environmental Management Programme (EMP) to ensure that such dust control measures are carried out throughout the power station's operational phase. Unfortunately we are unable to assist on this particular matter and suggest that you contact Anglo Coal directly to raise this issue.

5. NOV. 2012 12:21 OFFICE WORLD NO. 096 P. 1

NOTICE OF S24G RECTIFICATION APPLICATION FOR THE UNLAWFUL COMMENCEMENT OF THE CONSTRUCTION AND OPERATION OF FACILITIES AND INFRASTRUCTURE FOR THE RETURN TO SERVICE OF KOMATI POWER STATION, MPUMALANGA PROVINCE

Eskom

DEA REFERENCE NUMBER: 14/12/16/3/3/40
WASTE DIRECTORATE REFERENCE NUMBER: 12/9/11/L895/5/24G

STAKEHOLDER REGISTRATION FORM

Please complete and return to Iliso Consulting (Pty) Ltd by **12 October 2012.**

PO Box 68735
Highveld Park
0169

Tel: (012) 685 0949
Fax: (012) 665 1886
E-mail: nadine@iliso.com

TITLE	Mr	FIRST NAME	Patrick
INITIALS	PK	SURNAME	Jacobs
ORGANISATION	Schoongezicht Representing Committee		
POSTAL ADDRESS	SRC		
	1035	POSTAL CODE	Witbank
STREET ADDRESS	no 16 ... Schoongezicht Witbank Mpumalanga		
TEL NUMBER	0136990...	FAX NUMBER	
CELL NUMBER	0731091277		
E-MAIL			

COMMENTS: (You may use separate sheet if need be)

1. The following issues must be considered during the process:-

The bulk of the coal that is transported to Komati Power Station during ... Schoongezicht Mine ... contracted by Anglo Coal. The Process from the Source to ... the coal to be transported doesn't ... affected community ... a clear explanation

2. Please add the following colleagues/friends to your mailing list:

[illegible]

We thank you for your participation!

RECEIVED
2012 -11- 05

ILISO consulting

Engineers • Project Managers • Environmental Managers

Our ref: 1200073

13 December 2012

Attention: Mr Patrick Jacobs

Dear Sir,

S24G APPLICATION FOR RECTIFICATION

THE UNLAWFUL COMMENCEMENT OF ACTIVITIES LISTED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AS AMENDED, AND IN TERMS OF SECTION 19 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT 59 OF 2008) AT KOMATI POWER STATION

Environmental Impact Evaluation Directorate Ref: 14/12/16/3/2/40
Waste Authorisation and Disposal Management Directorate Ref: 12/9/11/L995/6/24G

Your concern raised in relation to the above-mentioned project, specifically with respect to dust pollution from the transport of coal by truck, affecting the Schoongezicht community, has been noted and investigated, and has been answered as follows:

Komati Power Station is not receiving any coal from Anglo Coal's Schoongezicht mini-pit at present. The trucks leaving Schoongezicht mini-pit are therefore supplying another user(s). All trucks supplying coal to the Komati Power Station are covered in order to reduce dust pollution. We have also included this as a requirement in the draft Environmental Management Programme (EMP) to ensure that such dust control measures are carried out throughout the power station's operational phase.

Unfortunately we are unable to assist on this particular matter and suggest that you contact Anglo Coal directly to raise this issue.

Please let me know if you would like to discuss this further (kindly provide a landline no. or email).

Yours faithfully,

Lea September
For ILISO Consulting

BLOEMFONTEIN
18 Victoria Road
Willows, Bloemfontein, 9301
Tel: 086 11 ILISO (45476)
Fax: 051 444 6186
bloemfontein@iliso.com

Suite 127, Private Bag X01
Brandhof, 9324

CAPE TOWN
Unit 1, Knowledge Park 3
cnr Heron Crescent and
Century Boulevard,
Century City, 7441
Tel: 086 15 ILISO (45476)
+27 21 525 1800
Fax: 086 588 8356
capetown@iliso.com

P O Box 305,
Century City, 7446

CENTURION (HO)
ILISO House
203 Witch-Hazel Ave
Highveld Technopark
Centurion, 0157
Tel: 086 12 ILISO (45476)
Fax: 012 665 1886
centurion@iliso.com

P O Box 68733,
Highveld, 0169

DURBAN
Derby Downs Office Park
Forest Square, 11 Derby Place
Westville, 3630
Tel: 031 266 2600
Fax: 031 266 2616
durban@iliso.com

P O Box 686,
Gillitts, 3603

EAST LONDON
Office Suite E7 Beacon Park
89 Beaconhurst Drive
Beacon Bay, 5241
Tel: 043 748 2933
Fax: 043 748 2936
eastlondon@iliso.com

P O Box 15758,
Beacon Bay, 5205

GEORGE
24 Plantation Road
Pontlerlands
George, 6530
Tel: 044 874 1432
Fax: 044 874 1333

KIMBERLEY
Suite 127, Private Bag X01
Brandhof, 9324
Tel: 086 11 ILISO (45476)
Fax: 086 616 5197

PORT ELIZABETH
ILISO House
101 Park Drive
St Georges Park
Port Elizabeth, 6001
Tel: 041 582 3856
Fax: 041 582 3857
portelizabeth@iliso.com

P O Box 5888,
Walmer, 6065

LIST OF REGISTERED STAKEHOLDERS

MainID	CategoryID	Company	Position	Surname	FirstName	Title	Address	City	Code	Tel	Fax	Cell	EMail
1	Local Government	Steve Tshwete Municipality	Ward 4	Nyambi	Mgevu Edward	Mr	PO Box 35	Blinkpan	2250			072 110 7597	
2	I&AP	Middelburg Environmental Justice Network		Hlatshwayo	Bafana		PO Box 33	Mhluzi	1053			076 923 2298	bafanahlatshwayo@webmail.co.za
3	I&AP	Middelburg Environmental Justice Network		Sibande	Bernard							083 753 7853	fbsibanda@gmail.com
5	I&AP	Greater Middelburg Residents' Association		Mnguni	Thomas							072 449 5655	greatermiddleburgra@hotmail.com
6	I&AP	Guqa Community Service Centre		Ngwenya	Lydia		PO Box 1422	Witbank	1035			082 349 9404	lydianozy@gmail.com
7	I&AP	Southern Africa Green Revolutionary Council		Hlababe	Matthews							082 707 9860	mnyeva@gmail.com
8	I&AP	Greater Delmas Civic Movement		Masombuka	Phillip							078 334 1259	masombukapb@yahoo.com
9	I&AP	Schoongesicht Community Movement		Sibande	Lucky							076 153 6028	decemberm@vodamail.co.za
10	I&AP	Schoongezicht Representing Committee		Jacobs	Patrick K		SRC, 16 Overmeyer street	Schoongezicht , Witbank	1035	013 699 0512		073 109 1273	
11	I&AP	Centre for Environmental Rights		Hugo	Robyn					021 447 1647			rhugo@cer.org.za
12	I&AP	groundWork		Peek	Bobby					033 342 5662			bobby@groundwork.org.za
13	I&AP	groundWork		Euripidou	Rico		6 Raven Street or P.O. Box 2375	Pietermaritzburg	3201	033 342 5662			rico@groundwork.org.za + siziwe@groundwork.org.za
15	I&AP	Earthlife Africa Johannesburg		Taylor	Tristen					011 339 3662			tristen@earthlife.org.za
17	Adjacent landowner/occupier of the land	Koornfontein Mines (Optimum Coal)	Environmental Manager	Mari	Kubashni	Ms	Private Bag X402	Blinkpan	2250	013 295 5716	013 295 5288	082 929 9585	kubashni.mari@optimumcoal.com
18	Adjacent landowner/occupier of the land			Kruger	Hilmer	Mr.	Hilkru Family Trust, PO Box 11033	Aerorand	1070			072 264 5977	hilmerkruger@live.co.za
19	Adjacent landowner/occupier of the land	Anglo American		Kitching	Dirk	Mr.						072 701 3767	dirk.kitching@angloamerican.com
20	Adjacent landowner/occupier of the land			Harmse	Jaco	Mr	PO Box 44	van Dyksdrif	2245			082 3883 077	

21	Adjacent landowner/occupier of the land			van Niekerk	A.		PO Box 190	Blinkpan	2250			072 221 0855	
22	Adjacent landowner/occupier of the land			van Wyk	Kobus		House 208 Komati. PO Box 58	Blinkpan	2250			072 770 1334	
23	Adjacent landowner/occupier of the land	Lakama Guesthouse					PO Box 1002	Kriel	2271	013 295 3256			
24	Adjacent landowner/occupier of the land			Kruger	DGP		Ostrich Ln 14. PO Box 113	Blinkpan	2250			082 966 0454	
25	Adjacent landowner/occupier of the land			Diepenaar	Johannes							079 578 0536	
26	Adjacent landowner/occupier of the land	School Koornfontein		Greef	Christo	Mr	Pelican Blvd. PO Box 25	Blinkpan	2250	013 295 3103	013 295 3205	082 922 7634	christo.greef@yahoo.com
27	Adjacent landowner/occupier of the land	SAPS Blinkpan	Captain	Mgwena	Sipho	Mr	Blinkpan main rd. Pvt bag X401	Blinkpan	2250	013 295 3161	013 295 3178	082 318 9542	blinkpansaps@saps.gov.za
28	Adjacent landowner/occupier of the land	NG Blinkpan		Taljaard	Rene		Blinkpan Hoofweg. PO Box 60	Blinkpan	2250	013 295 3016	013 295 3016	079 5266 079	blinkkerk@lantic.net
32	Adjacent landowner/occupier of the land			Mothoa	Lindah	Ms	Blinkpan main rd. Pvt bag X401	Blinkpan	2250	013 295 3181	013 295 3178	072 433 6584	
33	Adjacent landowner/occupier of the land	Islardu Boerdery		Bekker	Ronél		Plaas Goedehoop. PO Box 123	Blinkpan	2250		017 647 8903	082 387 2995	islardu@telkomsa.net
34	Adjacent landowner/occupier of the land			Masina	Ester		P67, Komati. PO Box 1577	Blinkpan	2250			071 398 3839	
35	Adjacent landowner/occupier of the land			Vos	Yolandi		P68, Komati. PO Box 242	Blinkpan	2250			079 491 3070/6	vosjw@eskom.co.za
36	Adjacent landowner/occupier of the land			Nieuwoud	Esthé		PO Box 1693	Blinkpan	2250			082 642 3268	
37	Adjacent landowner/occupier of the land			van Vuuren	Jansen							083 685 3052	
38	Adjacent landowner/occupier of the land			Emslie	Jeff		PO Box 244	Blinkpan	2250			071 585 2423	
39	Adjacent landowner/occupier of the land			Myburgh	Magdalena		P89, Hornbill, Komati					071 917 4624	
	Adjacent												

38	Adjacent landowner/occupier of the land			Emslie	Jeff		PO Box 244	Blinkpan	2250			071 585 2423	
39	Adjacent landowner/occupier of the land			Myburgh	Magdalena		P89, Hornbill, Komati					071 917 4624	
40	Adjacent landowner/occupier of the land			v.d. Westhuizen	Doelie		27					072 018 2645	
41	Adjacent landowner/occupier of the land			Nlhabelena	Hilkia		PO Box 283	Marishane	1064			073 142 2069	
42	Adjacent landowner/occupier of the land			Kruger	Johan		PO Box 1209	Middelburg	1050			082 332 3826	mrnkruger@yahoo.com
43	Adjacent landowner/occupier of the land			Skosana	Joyce		PO Box 2953	Thembelihle	2017			072 073 4191	
44	Adjacent landowner/occupier of the land			Mathibela	S.W.		PO Box 681/081	Siyabuswa	0472			082 257 5476/0	
45	Adjacent landowner/occupier of the land			Skosana	Bongi							082 357 4115	
46	Adjacent landowner/occupier of the land			Kgoele	Joseph							076 956 8156	
48	Adjacent landowner/occupier of the land			Nyambi	Bongefille		PO Box 35	Blinkpan	2250			076 707 4226	
49	Adjacent landowner/occupier of the land			Radingwane	Klaas		PO Box 331	Blinkpan	2250			073 835 0399	
50	Adjacent landowner/occupier of the land			Masilela	Thokozani		PO Box 757	Blinkpan	2250			071 259 0523	
51	Adjacent landowner/occupier of the land			Mahlangu	Solomon		PO Box 215	Blinkpan	2250			071 719 9490	
52	Adjacent landowner/occupier of the land			Bester	Bernard W.		Huis 195, Komati. PO Box 76	Blinkpan	2250			076 608 2925	besterd@gmail.com

53	Adjacent landowner/occupier of the land			Scheepers	Bokkie		Huis 195, Komati. PO Box 1644	Blinkpan	2250	013 295 3444		072 856 8552	
54	Adjacent landowner/occupier of the land			Swanepoel	Johan		Huis 197, Komati. PO Box 358	Blinkpan	2250			079 494 1192	
55	Local Government	Steve Tshwete LM	Health Inspector	Links	Solly	Mr				013 249 7000			slinks@stevetshwetelm.gov.za
56	Provincial Govt.	Economic development, Environment and Tourism	MEC	Mahlangu	Jabu	Mr	7 Government Boulevard, Building 4, Riverside Park Extension 2	Nelspruit		013) 766 4554	(013) 766 4617		cdias@mpg.gov.za / buyim@mpg.gov.za
57	Adjacent landowner/occupier of the land	Telkom		Zama	Zamindlela		PO BOX 4617	Nelspruit	1200	013-7551881		0825793809	zamazb@telkom.co.za
58	I&AP	Middelburg Chamber of Commerce & Industry	CEO	Ott	Anna-Marth					013 243 2253		083 458 2865	ceo@middelburginfo.com / midcham@iafrica.com
59	Adjacent landowner/occupier of the land	Telkom	Sustainable Development head	Maepa	Lindiwe	Ms							maepaLJ@telkom.co.za, PillayJ1@telkom.co.za, ELSS@telkom.co.za, BurgerVS@telkom.co.za
60	Provincial Govt.	Mpumalanga Provincial Heritage Resources Authority					1st and 2nd Floor, Building 5, Government Complex, 7 Government Boulevard,	Nelspruit		013 766 5196			bmoduka@mpg.gov.za
61	I&AP	SANRAL		Gomes	Nuno		38 Ida Street, Menlo Park, 0081, Tshwane			012 426 6200			gomes@nra.co.za
62	Business / Industry	THM		Vermeulen	Kobus							082 304 6566	kobus.vermeulen@thm.co.za
63	I&AP	Department of Water Affairs	Director: Water Sector Regulation and Use	Musekene	M J	Ms	Private Bag X11259	Nelspruit	1200	013 759 7313	086 666 6217	083 492 9690	MusekeneM@dwa.gov.za

APPENDIX C: SPECIALIST STUDIES

APPENDIX D: DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME