



# **Environmental Scoping Report for the Proposed Continuous Ash Disposal Facility for the Matimba Power Station in Lephalale, Limpopo Province**

Draft

Eskom Holdings SOC (Ltd)

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## GLOSSARY OF TERMS

TERM	DEFINITION
<b>Alternatives</b>	Different means of meeting the general purpose and requirements of the activity, which may include site or location alternatives; alternatives to the type of activity being undertaken; the design or layout of the activity; the technology to be used in the activity and the operational aspects of the activity.
<b>Conglomerate</b>	Type of rock constituted of pebbles of different components that are stuck together.
<b>Construction</b>	Means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.
<b>Cumulative Impact</b>	The impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area
<b>Do nothing alternative</b>	The 'do-nothing' alternative is the option of not undertaking the proposed activity.
<b>Environmental Assessment Practitioner (EAP)</b>	The individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.
<b>Environmental Impact Assessment (EIA)</b>	In relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application as defined in NEMA.
<b>Environmental Management Programme (EMPr)</b>	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. This EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.
<b>Fatal Flaw</b>	Issue or conflict (real or perceived) that could result in developments being rejected or stopped.
<b>Graben</b>	A depressed block of land bordered by parallel faults.
<b>Interested and Affected Party (I&amp;AP)</b>	Any person, group of persons or organisation interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
<b>Mitigate</b>	The implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.
<b>No-go Option</b>	in this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.
<b>Plan of Study for Environmental Impact Assessment</b>	A document which forms part of a scoping report and sets out how an environmental impact assessment must be conducted.
<b>Public Participation Process</b>	A process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
<b>Throw</b>	Vertical distance moved when a fault is formed.
<b>Relevè</b>	A method of sampling vegetation.

## ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CA	Competent Authority
CFA	Coal Fly Ash
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment Report
EMPr	Environmental Management Programme
ESR	Environmental Scoping Report
ESS	Environmental Scoping Study
FGM	Focus Group Meeting
GIS	Geographic Information System
GN	Government Notice
GRIP	Groundwater Resource Information Project
HDNS	High Density Noise Sensitive
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IDP	Integrated Development Plans
IEM	Integrated Environmental Management
IUCN	International Union for Conservation of Nature
LDEDET	Limpopo Department of Economic Development, Environment and Tourism
MAE	Mean Average Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
NEM: AQA	National Environmental Management – Air Quality Act (No 39 of 2004)
NEM: BA	National Environmental Management – Biodiversity Act (No 10 of 2004)
NEM: WA	National Environmental Management – Waste Act (No 59 of 2008)
NEMA	National Environmental Management Act (No 107 of 1998)
NGA	National Groundwater Archive
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act (No 25 of 1999)
NWA	National Water Act (No 36 of 1998)
PoS	Plan of Study
PFD	Process Flow Diagram
RHDHV	Royal HaskoningDHV
SAHRA	South African Heritage Resources Agency

SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SIA	Social Impact Assessment
SWMP	Storm Water Management Plan
TWINSpan	Two Way Indicator Species Analysis Technique
USEPA	United States Environmental Protection Agency
WML	Waste Management License
WSB	Water and Salt Balance
WUL	Water Use License

# 1 INTRODUCTION

Eskom Holdings SOC Limited (Eskom) is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Eskom's core business is in the generation, transmission and distribution of electricity. Eskom generates approximately 95% of the electricity used in South Africa.

Matimba Power Station is a 3990 MW installed capacity base load coal-fired power station, consisting of six units. Matimba is a direct dry cooling power station, an innovation necessitated by the severe shortage of water in the area where it is situated. The station obtains its coal from the Exxaro Grootegeluk Colliery for the generation of electricity.



**Figure 1: Matimba Power Station**

Ash is generated as a by-product from combustion of coal from the power station and Matimba produces approximately 4.8 million tons of ash annually. This ash is currently being disposed by means of 'dry ashing' approximately three kilometres south of the power station.

The proposed project entails the development of a continuous ash disposal facility with the following specifications:

- Airspace with a capacity of 297 million m<sup>3</sup> (remaining);
- Ground / development footprint of 651 ha (remaining fenced area including pollution control dams and other infrastructure, like conveyor belts).

This proposed project is located within the Lephalale Local Municipality in the Waterberg District Municipality, Limpopo Province.

## 1.1 Project Need and Justification

Approximately 4.8 million tons of ash is produced annually from the Matimba Power Station. The proposed ash disposal facility will ensure that the power station is able to accommodate the ashing requirements for the remaining life (44 years) of the power station. If the ash disposal facility is not constructed, Matimba Power Station will not be able to effectively continue with its electricity generation operations for its remaining life because the ash produced from coal combustion must be disposed of properly.

Matimba Power Station envisages aligning the continuation of ash disposal (dry ashing) for the remaining life of the power station to current waste legislation, the National Environmental

Management: Waste Act (NEMWA), Act 59 of 2008, and therefore, requires the necessary licensing in terms of the Environmental Impact Assessment (EIA) Regulations (2010) promulgated under the National Environmental Management Act (NEMA,) Act 107 of 1998, (as amended).

## 1.2 Approach to the Environmental Scoping Study

The environmental impacts associated with the proposed project require investigation in compliance with the EIA Regulations (2010) published in Government Notice No. R. 543 to No. R. 546 and read with Section 24 (5) of the National Environmental Management Act - NEMA (Act No 107 of 1998) as amended, as well as Government Notice No. 718 of the National Environmental Management: Waste Act – NEM:WA (Act No 59 of 2008). An integrated environmental authorisation process will apply as the Minister (Environmental Affairs) is both the -

- (a) competent authority for the environmental authorisation applied for in terms of the EIA Regulations, 2010 promulgated under NEMA; and
- (b) licensing authority for the waste management licence in terms of NEM:WA.

The required environmental studies include the undertaking of an Environmental Impact Assessment (EIA) process. This process is being undertaken in two phases (see Figure 2) that will ultimately allow the Competent Authority (Department of Environmental Affairs) to make an informed decision:

- Phase 1 - Environmental Scoping Study (ESS) including, site selection and Plan of Study for EIA; and
- Phase 2 - Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPr).

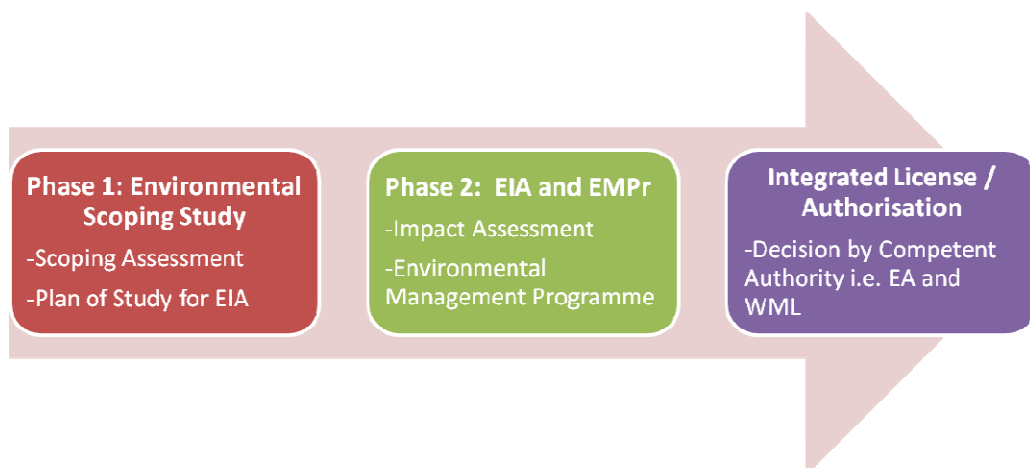


Figure 2: Environmental Studies Flowchart

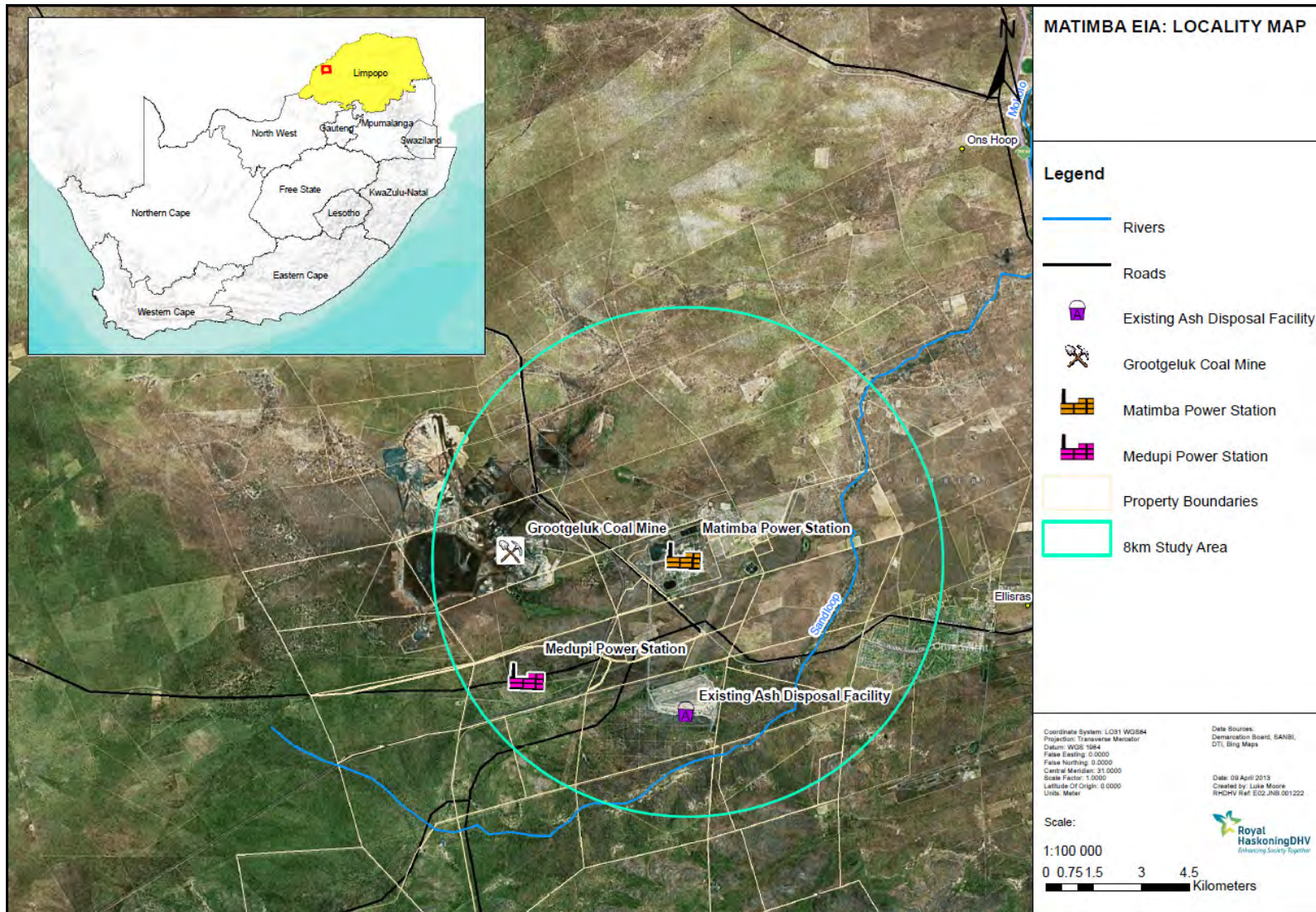


Figure 3: Locality Map

### 1.2.1 Environmental Scoping Study (ESS)

The ESS provides a description of the receiving environment and how the environment may be affected by the proposed continuous ash disposal facility. The ESS will also identify any fatal flaws, alternatives and mitigation options to be evaluated and investigated during the EIA phase of the project. Impacts relating to soil and agricultural potential, hydrology, geohydrology, air quality, noise, terrestrial biodiversity (fauna and flora), wetlands, social aspects, heritage, traffic, and visual impacts will be investigated in this ESS. Issues that are considered to be of significance will be recommended for further investigation and assessment within the EIA phase of the project.

Desktop studies making use of existing information (previous specialist studies, monitoring reports, feasibility studies), and a site visit are used to highlight and assist in the identification of potential significant impacts (both social and biophysical) associated with the proposed project.

RHDHV was assisted by various specialists in order to comprehensively identify both potentially positive and negative environmental impacts (social and biophysical) associated with the project. These specialists and their fields of expertise are outlined in Table 1:

**Table 1: Specialist studies**

Specialist Field	Specialist and Organisation
Soils and Agricultural Potential	<i>Dr Johan van der Waals – Terra Soil Science</i>
Biodiversity Assessment	<i>Riaan Robbeson – Bathusi Environmental Consulting Dewald Kamffer - Faunal Specialists Incorporated</i>
Surface Water Assessment	<i>Paul da Cruz – Royal HaskoningDHV</i>
Visual Impact Assessment	<i>Paul da Cruz – Royal HaskoningDHV</i>
Air Quality Impact Assessment	<i>Stuart Thompson – Royal HaskoningDHV</i>
Heritage Assessment	<i>Johnny van Schalkwyk - Private</i>
Geohydrology Assessment	<i>Claudia Brites - GCS Water &amp; Environmental Consultants</i>
Hydrology Assessment	<i>Karen King - GCS Water &amp; Environmental Consultants</i>
Social Opinion	<i>Kim Moonsamy - Royal HaskoningDHV</i>
Geology and Geotechnical	<i>Sodhie Naicker – Kai Batla Mineral Industry Consultants</i>
Traffic Impact Assessment	<i>Ivan Reutener - Royal HaskoningDHV</i>
Noise Impact Assessment	<i>Derek Cosijn - Jongens Keet Associates</i>
(Environmental) Engineering Design	<i>Richard Emery - Jeffares and Green (Pty) Ltd</i>

Additional issues for consideration will be extracted from feedback during the public participation process, which commenced at the beginning of the Scoping phase, and will continue throughout the duration of the project. All issues identified during this phase of the study have been documented within this Environmental Scoping Report (ESR). Thus, this ESR provides a record of all issues identified as well as any fatal flaws, in order to make recommendations regarding the project and further studies required to be undertaken within the EIA phase of the proposed project.

### 1.3 Details of the Environmental Assessment Practitioner

Royal HaskoningDHV - RHDHV (formerly known as SSI Engineers and Environmental Consultants (Pty) Ltd), is the service provider appointed by Eskom to provide independent Environmental Assessment Practitioner (EAP) services in the undertaking of appropriate environmental studies for this proposed project.

The professional team of RHDHV have considerable experience in the environmental management and EIA fields. RHDHV has been involved in and/or managed several of the largest Environmental Impact Assessments undertaken in South Africa to date. A specialist area of focus is on the assessment of multi-faceted projects, including the establishment of linear developments (national and provincial roads, and power lines), bulk infrastructure and supply (e.g. wastewater treatment works, pipelines, landfills), electricity generation and transmission, the mining industry, urban, rural and township developments, environmental aspects of Local Integrated Development Plans (LIDPs), as well as general environmental planning, development and management.

The particulars of the EAP are presented in Table 2 below:

**Table 2: Details of EAP**

Details	
<b>Consultant:</b>	Royal HaskoningDHV (formerly known as SSI Engineers and Environmental Consultants (Pty) Ltd)
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<b>Expertise:</b>	<p>Phyllis Kalele is a Senior Environmental Consultant with a MSc. Environment and Development. Ms. Kalele has experience in various facets of environmental management including conducting the Public Participation process; compiling Environmental Impact Reports and Environmental Management Programmes; conducting environmental awareness training; and conducting legal compliance audits. She is a registered Professional Natural Scientist (<i>Pr Sci Nat</i> 400456/11) with the South African Council for Natural Scientific Professions (SACNASP).</p> <p>Prashika Reddy is a Principal Associate / Senior Environmental Scientist (<i>Pr Sci Nat</i> 400133/10) with a BSc Honours in Geography. Ms Reddy has the necessary experience in various environmental fields including: environmental impact assessments, environmental management plans/programmes, public participation and environmental monitoring and auditing. Ms Reddy has extensive experience in compiling environmental reports (Screening, Scoping, EIA and <i>Status Quo</i> Reports). Ms Reddy is/has been part of numerous multi-faceted large-scale projects, including the establishment of linear developments (roads, and power lines); industrial plants; electricity generation plants and mining-related projects.</p> <p>Malcolm Roods is a Principal with RHDHV specializing in Environmental Impact Assessments (EIA) for electricity supply (generation, transmission and distribution), road infrastructure, residential developments as well as water management projects. This builds on a broad government background, which has made him particularly flexible. His past experiences include 6 years public service which included policy development, environmental law reform and EIA reviews. His experience also includes 5 years of environmental consulting in the field of Impact Assessment and Authorisation Applications, with a focus on legislative requirements and sector area management. He is also a certified</p>



Details
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## 1.4 Environmental Scoping Report Structure

This draft ESR is being compiled according to the guidelines provided in Government Notice R.543 of the EIA Regulations (2010) – refer to Table 3.

**Table 3: ESR Requirements According to Section 28 of GN R. 543**

ESR Requirements according to Section 28 of GN R. 543	Chapter
(a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP to carry out scoping procedures	1
(b) a description of the proposed activity	3
(c) a description of any feasible and reasonable alternatives that have been identified	4
(d) a description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is (i) a linear activity, a description of the route of the activity; or (ii) an ocean-based activity, the coordinates where the activity is to be undertaken	1
(e) a description of the environment that may be affected by the activity and the manner in which the activity may be affected by the environment	6
(f) an identification of all legislation and guidelines that have been considered in the preparation of the scoping report	2
(g) a description of environmental issues and potential impacts, including cumulative impacts, that have been identified	0
(h) details of the public participation process conducted in terms of regulation 27 (a), including (i) the steps that were taken to notify potentially interested and affected parties of the application; (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given; (iii) a list of all persons or organizations that were identified and registered in terms of regulation 55 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues	5
(i) a description of the need and desirability of the proposed activity	1
(j) a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	4
(k) copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties	5

<b>ESR Requirements according to Section 28 of GN R. 543</b>	<b>Chapter</b>
(l) copies of the minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants	5
(m) any responses by the EAP to those representations and comments and views	5
(n) a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include (i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken (ii) an indication of the stages at which the competent authority will be consulted (iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and (iv) particulars of the public participation process that will be conducted during the environmental impact assessment process	9
(o) any specific information required by the competent authority; and	-
(p) any other matters required in terms of sections 24(4)(a) and (b) of the Act	-

## 2 ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

In order to protect the environment and ensure that this development is undertaken in an environmentally responsible manner, there are a number of significant pieces of environmental legislation that will need to be complied with. They include the following:

### 2.1 National Environmental Management Act (No 107 of 1998)

The National Environmental Management Act (No 107 of 1998, “NEMA”) (as amended) states that the principles of Integrated Environmental Management (IEM) should be adhered to in order to ensure sustainable development. A vital underpinning of the IEM procedure is accountability to the various parties that may be interested in or affected by a proposed development. Public participation is a requirement of the IEM procedure, in terms of the identification of potentially significant environmental impacts during the EIA process. The IEM procedure aims to ensure that the environmental consequences of development proposals are understood and adequately considered during all stages of the project cycle, and that negative aspects are resolved or mitigated and positive aspects enhanced. Furthermore, Section 28(1) of the Act states that “every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring”. If such pollution cannot be prevented then appropriate measures must be taken to minimise or rectify such pollution.

In 2010, EIA Regulations were promulgated in terms of NEMA, in order to outline the processes relating to environmental authorisations for the commencement of activities in order to avoid detrimental impacts on the environment or, where it cannot be avoided, to mitigate and effectively manage these impacts and optimise positive environmental impacts. These Regulations and a revised set of Listed Activities (Listing Notices 1, 2 and 3) came into force on 02 August 2010. The listed activities applicable to the project are listed in Table 4.

**Table 4: Listed Activities Applicable to the Project**

Activities subject to a Basic Assessment in terms of GN R.544 – Listing Notice 1	Activities subject to a Scoping and EIA in terms of GN R.545 – Listing Notice 2	Activities subject to a Basic Assessment in terms of GN R.546 – Listing Notice 3
<p><b>Activity 9</b> The construction of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water, sewage or storm water (i) with an internal diameter of 0.36 meters or more or (ii) with a peak throughput of 120 litres per second or more.</p> <p><b>Applicability:</b> Storm water channels will be required for the diversion of storm water run off to new or existing storm water retention ponds. At this stage the peak throughput is unknown.</p>	<p><b>Activity 3</b> The construction of facilities or infrastructure for the storage, or storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</p> <p><b>Applicability:</b> Diesel may be stored at the site for the fuelling of construction vehicles and equipment. Quantities have not been determined.</p>	<p><b>Activity 4</b> The construction of a road wider than 4 metres with a reserve less than 13.5 metres.</p> <p>1. In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 kilometres from</p>

Activities subject to a Basic Assessment in terms of GN R.544 – Listing Notice 1	Activities subject to a Scoping and EIA in terms of GN R.545 – Listing Notice 2	Activities subject to a Basic Assessment in terms of GN R.546 – Listing Notice 3
		<p>national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p><b>Applicability:</b> This activity will be verified during the detailed EIA study with detailed engineering input, specialist input.</p>
<p><b>Activity 9</b> The construction of:</p> <ul style="list-style-type: none"> <li>(i) canals;</li> <li>(ii) channels;</li> <li>(iii) bridges;</li> <li>(iv) dams;</li> <li>(v) weirs;</li> <li>(vi) bulk storm water outlet structures;</li> <li>(vii) marinas;</li> <li>(viii) jetties exceeding 50 square meters in size;</li> <li>(ix) slipways exceeding 50 square meters in size;</li> <li>(x) buildings exceeding 50 square meters in size; or</li> <li>(xi) infrastructure or structures covering 50 square meters or more</li> </ul> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development.</p> <p><b>Applicability:</b> The ash disposal facility to be constructed will cover an area of 651 ha and the presence of any watercourses will be confirmed on completion of surface water specialist studies.</p>	<p><b>Activity 15</b> Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;</p> <p>Except where such physical alteration takes place for:</p> <ul style="list-style-type: none"> <li>(i) linear development activities; or</li> <li>(ii) agriculture or afforestation where activity 16 in this schedule will apply.</li> </ul> <p><b>Applicability:</b> The ash disposal facility to be constructed will cover an area of 651 ha.</p>	<p><b>Activity 16</b> The construction of:</p> <ol style="list-style-type: none"> <li>1. infrastructure covering 10 square meters or more</li> </ol> <p>where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <ol style="list-style-type: none"> <li>1. In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, and Northern Cape.</li> <li>ii. Outside urban areas, in:             <ul style="list-style-type: none"> <li>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>(bb) National Protected Area Expansion Strategy Focus areas;</li> <li>(cc) World Heritage Sites;</li> <li>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</li> <li>(ee) Sites or areas identified in terms of an International Convention;</li> <li>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</li> <li>(gg) Core areas in biosphere reserves;</li> <li>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</li> <li>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no</li> </ul> </li> </ol>

Activities subject to a Basic Assessment in terms of GN R.544 – Listing Notice 1	Activities subject to a Scoping and EIA in terms of GN R.545 – Listing Notice 2	Activities subject to a Basic Assessment in terms of GN R.546 – Listing Notice 3
		<p>such development setback line is determined.</p> <p><b>Applicability:</b> This activity will be verified during the detailed EIA study with detailed engineering input, specialist input.</p>
<p><b>Activity 18</b> The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from a watercourse</p> <p><b>Applicability:</b> The ash disposal facility to be constructed will cover an area of 651 ha and the presence of any watercourses will be confirmed on completion of surface water specialist studies.</p>		
<p><b>Activity 22</b> The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</p> <p><b>Applicability:</b> Access roads may be constructed in order to reach all sections of the ash disposal facility site during the construction and operational (maintenance) phases of the project.</p>		
<p><b>Activity 24</b> The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p> <p><b>Applicability:</b> The ash disposal facility to be constructed will cover an area of 651 ha. The properties falling under the 8 km radius study area may fall under</p>		

Activities subject to a Basic Assessment in terms of GN R.544 – Listing Notice 1	Activities subject to a Scoping and EIA in terms of GN R.545 – Listing Notice 2	Activities subject to a Basic Assessment in terms of GN R.546 – Listing Notice 3
open space or conservation zoning.		
<p><b>Activity 28</b> The expansion of or changes to existing facilities for any process or activity where such expansion will result in the need for a permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p> <p><b>Applicability:</b> A Water Use License (WUL) and a Atmospheric Emission License (AEL) will need to be applied for the proposed ash disposal facility.</p>		
<p><b>Activity 37</b> The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) the facility or infrastructure is expanded by more than 1000 meters in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more.</p> <p><b>Applicability:</b> Storm water channels will be required for the diversion of storm water run off to new or existing storm water retention ponds. At this stage the peak throughput is unknown.</p>		
<p><b>Activity 39</b> The expansion of canals, channels, bulk storm water outlet structures within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.</p> <p><b>Applicability:</b> The ash disposal facility to be constructed will cover an area of 651 ha and the presence of any watercourses will be confirmed on completion of surface water specialist studies.</p>		

Activities subject to a Basic Assessment in terms of GN R.544 – Listing Notice 1	Activities subject to a Scoping and EIA in terms of GN R.545 – Listing Notice 2	Activities subject to a Basic Assessment in terms of GN R.546 – Listing Notice 3
<p><b>Activity 40</b>  <i>The expansion of:                      (iv) infrastructure or structures covering 50 square meters or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</i></p> <p><b>Applicability:</b>                      The ash disposal facility to be constructed will cover an area of 651 ha and the presence of any watercourses will be confirmed on completion of surface water specialist studies.</p>		
<p><b>Activity 47</b>  <i>The widening of a road by more than 6 meters or the lengthening of a road by more than 1 kilometre where no reserve exists, where the existing reserve is wider than 13,5 meters or where the existing road is wider than 8 meters.</i></p> <p><b>Applicability:</b>                      Access roads may be constructed in order to reach all sections of the ash disposal facility site during the construction and operational (maintenance) phases of the project.</p>		
<p><b>Activity 49</b>  <i>The expansion of facilities or infrastructure for the bulk transportation of dangerous goods in solid form, outside an industrial complex or zone, by an increased throughput capacity of 50 tons or more per day.</i></p> <p><b>Applicability:</b>                      The overland ash conveyor facilities may be expanded to the proposed ash disposal facility. A suitable site for ash disposal will be determined once all site alternatives have been assessed.</p>		

## 2.2 National Environmental Management: Waste Act (No 59 of 2008)

On 03 July 2009, under section 19 (1) of the National Environmental Management: Waste Act (No 59 of 2008) [NEM: WA], a list of waste management activities (GN R.718) which have, or are likely to have a detrimental effect on the environment was published. In terms of this Act, no person may commence, undertake or conduct a waste management activity listed in GN R.718 unless a license is issued in respect of that activity. This list of applicable waste activities requiring a Waste Management License for this project, in terms of the NEM:WA, are presented in Table 5.

**Table 5: List of waste activities requiring a Waste Management License in terms of the NEM: WA**

GN R.718 – Category A	GN R.718 – Category B
<p>A person who wishes to commence, undertake or conduct an activity listed under this Category, must conduct a basic assessment process, as stipulated in the EIA Regulations (2010) made under section 24(5) of the NEMA (No 107 of 1998) as part of a waste management license application</p>	<p>A person who wishes to commence undertake or conduct an activity listed under this Category, must conduct an EIA process, as stipulated in the EIA Regulations (2010) made under section 24(5) of the NEMA (No 107 of 1998) as part of a waste management license application</p>
<p><b>Activity 19</b> The expansion of facilities of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of pollution, effluent or waste.</p> <p><b>Applicability:</b> The existing WUL will have to be amended / or a new WUL will have to be applied for depending on the final site selected for the proposed ash disposal facility. This will be done prior to construction.</p>	<p><b>Activity 1</b> The storage including the temporary storage of hazardous waste in lagoons.</p> <p><b>Applicability:</b> Ash water return dams will need to be constructed as part of the ash disposal facility.</p>
	<p><b>Activity 9:</b> The disposal of any quantity of hazardous waste to land.</p> <p><b>Applicability:</b> Ash produced from the combustion of coal at the power station will be disposed of at the disposal facility. This will be confirmed once the ash classification study is completed.</p>
	<p><b>Activity 11:</b> The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity).</p> <p><b>Applicability:</b> An ash disposal facility will be constructed for the disposal of ash.</p>

As indicated in *section 1.2*, that as the environmental impacts associated with the proposed project require investigation in compliance with the EIA Regulations (2010) as well as the NEM:WA, an integrated environmental authorisation process is therefore being followed.



## 2.3 National Water Act (No 36 of 1998)

The major objectives of the National Water Act (NWA) are to:

- Aid in providing basic human needs;
- Meet the growing demand of water in a sustainable manner;
- Ensure equal access to water and use of water resources;
- Protect the quality of water of natural resources;
- Ensure integrated management of water resources;
- Foster social and economic development; and
- Conserve aquatic and related ecosystems.

The Matimba Power Station currently holds a Water Use License (WUL) for the operation of the Matimba Power Station and all its related activities. The following water uses (Table 6) are licensed under this license:

**Table 6: Licensed Water Uses for the Matimba Power Station**

Relevant water use	Description	Properties on which to Exercise License
<b>Section 21 (a)</b>	Taking water from a water resource	Farm Grootestryd 465 LQ
<b>Section 21 (b)</b>	Storing water	Farm Grootestryd 465 LQ
<b>Section 21 (e)</b>	Engaging in a controlled activity identified as such in section 37 (1) (which includes the intentional recharging of an aquifer with any waste or water containing waste) or declared under section 38 (1)	Farms Grootestryd 465 LQ, Nelson's Kop 464, Zwartwater 507 LQ
<b>Section 21 (g)</b>	Disposing of waste in a manner which may detrimentally impact on a water resource	Farn Altoostyd 506 LQ

Dependent on the final site that will be selected for the location of the ash disposal facility, an application for amendment of the current WUL will be lodged or a new WUL will be applied for by Eskom.

## 2.4 National Environmental Management: Air Quality Act (No 39 of 2004)

The National Environmental Management: Air Quality Act (No. 39 of 2004) [NEM:AQA) repeals the whole of the Air Pollution Prevention Act (No. 45 of 1965). The purpose of the Air Quality Act is to reform the law regulating air quality in order to protect the environment by providing measures for the prevention of pollution and ecological degradation, while, promoting justifiable economic and social development. The Air Quality Act seeks to provide national standards regulating air quality monitoring management and control.

NEM:AQA has shifted the approach of air quality management from source-based control to receptor-based control. The main objectives of the Act are to:

- Give effect to everyone's right 'to an environment that is not harmful to their health and well-being'
- Protect the environment by providing reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

NEM: AQA 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'. These 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 is poor and the potential for health effects is greatest. More stringent standards can be established at the provincial and local levels.

The control and management of emissions in the AQA relates to the listing of activities that are sources of emission and the issuing of emission licences. Listed activities are defined as activities which 'result in atmospheric emissions and are regarded as having a significant detrimental effect on the environment, including human health'. Listed activities have been identified by the Minister of Environmental Affairs and atmospheric emission standards have been established for each of these activities. These listed activities now require an atmospheric emission licence to operate. The issuing of emission licences for Listed Activities is the responsibility of the Metropolitan and District Municipalities.

In addition, the Minister may declare any substance contributing to air pollution as a priority pollutant. Any industries or industrial sectors that emit these priority pollutants will be required to implement a Pollution Prevention Plan. Municipalities are required to 'designate an air quality officer to be responsible for co-ordinating matters pertaining to air quality management in the Municipality'. The appointed Air Quality Officer is responsible for the issuing of atmospheric emission licences.

## 2.5 National Heritage Resources Act (No 25 of 1999)

In terms of section 38 (subject to the provisions of subsections (7), (8) and (9) of the National Heritage Resources Act (No 25 of 1999) [NHRA], any person who intends to undertake a development categorised as:

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50 m in length;
- Any development or other activity which will change the character of a site:
  - Exceeding 5000 m<sup>2</sup> in extent;
  - Involving three or more existing erven or subdivisions thereof; or
  - Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - The costs of which will exceed a sum set in terms of regulations by South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority;
- The re-zoning of a site exceeding 10000 m<sup>2</sup> in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority –

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The SAHRA is listed on the database as an interested and affected party and will be updated on the progress of the EIA study during the different phases.

## 2.6 National Environmental Management: Biodiversity Act (No 10 of 2004)

The project needs to comply with the National Environmental Management: Biodiversity Act (No 10 of 2004) [NEM: BA] in providing the cooperative governance in biodiversity management and conservation. The Biodiversity Act provides for the Minister to publish a notice in the Government Gazette that issues norms and standards, and indicators for monitoring progress for the achievement of any of the objectives of the Act.

The NEM: BA also provides for:

- The National Biodiversity Framework
- Bioregional Plans
- Biodiversity Management Plans

- Biodiversity Management Agreements
- The identification, listing and promotion of threatened or protected ecosystems
- Alien invasive species control and enforcement

### 2.6.1 National Spatial Biodiversity Assessment (2004)

This informs the policies, plans and day to day activities of a wide range of sectors both public and private. A spatial biodiversity assessment can take place at different spatial scales, from global to local. It involves mapping information about biodiversity features such as species, habitats and ecological processes, protected areas and current and future patterns of land and resource use. It provides a national context for assessments at the sub national scale and points to broad priority areas where further investigation, planning and action are warranted.

It identifies three keys strategies for conserving South Africa's biodiversity existence from the assessment, namely:

- Pursuing opportunities to link biodiversity and socio-economic development in priority geographic areas;
- Focusing on emergency action on threatened ecosystems, to prevent further loss of ecosystem functioning; and
- Expanding of the protected area network.

## 2.7 Other Legislative Requirements

**Table 7: Legislative requirements in terms of other Acts, Policies and Plans**

Legislation	Relevant Sections	Relates to
<b>The Conservation for Agricultural Resources Act (No 43 of 1983) and Regulations</b>	Section 6	Implementation of control measures for alien and invasive plant species.
<b>National Forests Act (No 84 of 1998) and Regulations</b>	Section 7  Sections 12-16	No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under section 7(4) or section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette.  These sections deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodland or species. In terms of section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.
<b>Fencing Act (No 31 of 1963)</b>	Section 17	Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 meters on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.
<b>Occupational Health and Safety Act (No 85 of 1993) and Regulations</b>	Section 8  Section 9	General duties of employers to their employees.  General duties of employers and self employed persons to person other than their employees.
<b>Hazardous Substance Act (No 15 of 1989)</b>		Provides for the definition, classification, use,

<b>Legislation</b>	<b>Relevant Sections</b>	<b>Relates to</b>
<b>1973) and Regulations</b>		operation, modification, disposal or dumping of hazardous substances.
<b>Mine Health and Safety Act (No 29 of 1996)</b>	Chapter 2 Chapter 8	Health and safety at mines. General provisions.
<b>Road Transportation Act (No 74 of 1977)</b>		
<b>Waterberg District Municipality Spatial Development Framework (no date)</b>		
<b>Waterberg District Municipality Integrated Development Plan (2011-2012)</b>		
<b>Waterberg District Municipality Local Economic Development Strategy (2007)</b>		
<b>Waterberg District Municipality Environmental Management Framework (2010)</b>		
<b>Lephalale Local Municipality Integrated Development Plan (2012-2013)</b>		
<b>Lephalale Local Municipality Spatial Development Framework (2008)</b>		
<b>Lephalale Local Municipality Local Economic Development Strategy (2008)</b>		
<b>Other Local Municipality Bylaws</b>		

### 3 PROJECT DESCRIPTION

#### 3.1 Matimba Power Station Operation and Existing Ashing Process

Coal is transported from the Exxaro Grootegeluk mine to the Matimba Power Station via an overland conveyor. As the coal arrives at the power station, the load is divided via two conveyors: to the stockpile or directly to the control bin. From the control bin the coal is transported, again via conveyors, to the silos and boilers. From the boilers fly-ash is transported by overland conveyors to the ash disposal facility (a distance of about 3 km) and since the ash contains 12% moisture, dust production is minimal.

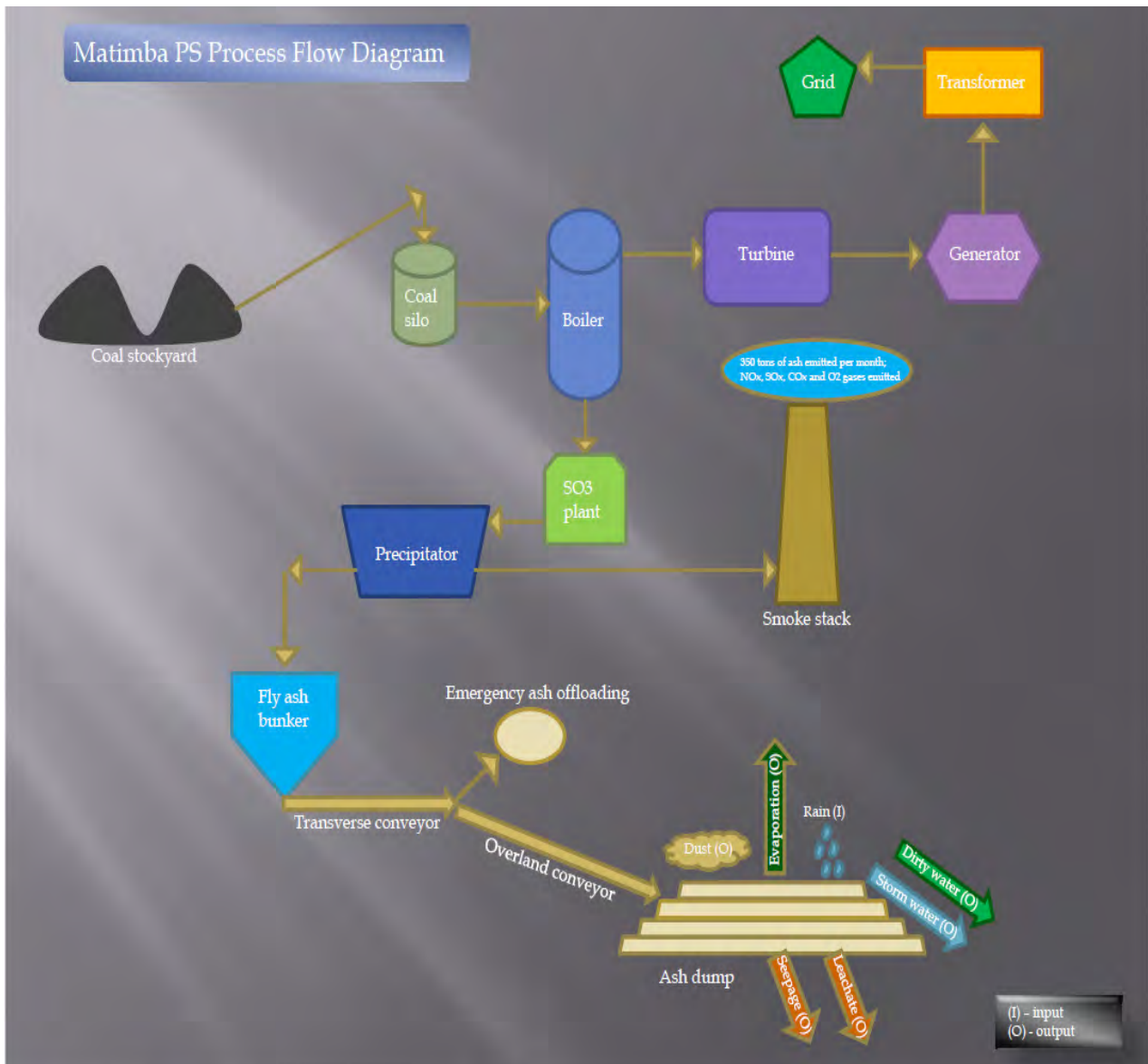


Figure 4: Process Flow at the Matimba Power Station and Ash Disposal Facility

Next to the conveyor belt on the ash heap is a machine called a stacker that travels slowly alongside the conveyor belt, removing ash from it and placing this ash on the stacker's far side over the edge of the heap. The stacker builds a new face onto the side of the ash pile as it travels across the dump.

Behind the stacker, earth-moving equipment trims and tidies the placed ash forming a new extended terrace in front of the one that the stacker was travelling along next to the conveyor belt. When the new face is completed, the conveyor belt and stacker are moved towards the new face and the stacker returns across the ash heap building a new face onto the one it had just completed. The stacker can deposit more free ash per shift due to flexibility in swinging and its longer reach; it's therefore used as the main ashing system.

A spreader is also used in addition to the stacker. The spreader machine is a mobile crawler mounted machine with a single fixed boom. The spreader is designed to operate in a number of parallel operations and cannot swing in operation as it is not fixed to the link conveyor. The spreader is thus, less flexible in operation than the stacker.

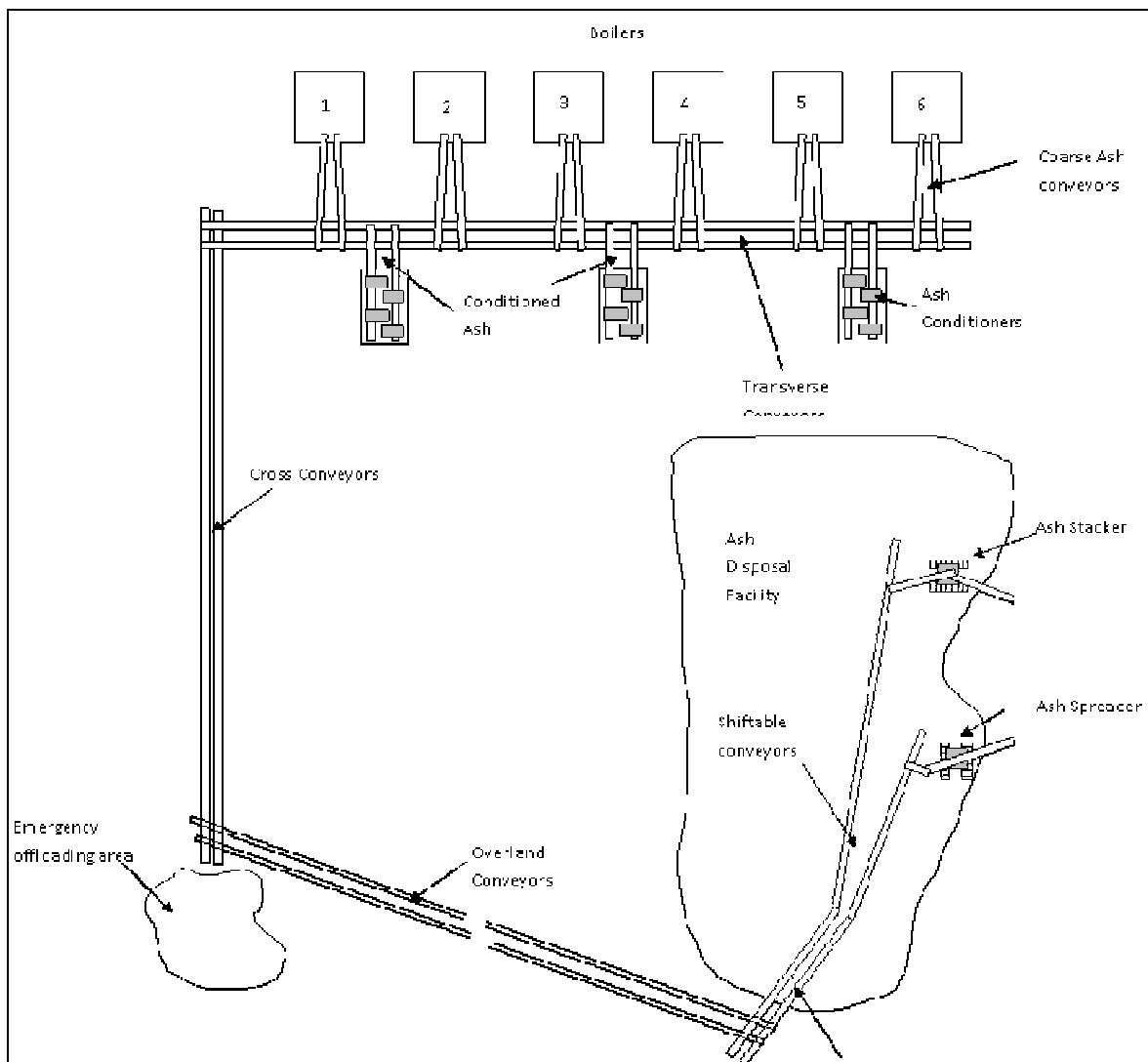


Figure 5: Illustration of Transport of Ash from the Power Station to the Ash Disposal Facility

To assist with the spreading of ash and on site operational requirements, a few construction plant equipment and machinery are located on site namely:

a) 1x D8 CAT Bull dozer

This earth moving equipment is used for moving ash to positions outside the reach of the spreader or stacker machines; trimming and profiling of the ash heap surface, side slopes and conveyor platforms; and moving the head and tail stations during conveyor shifts.

b) 1x 966 CAT Front end loader

This equipment is used for loading dust suppression soil and rehabilitation soil onto trucks, for general maintenance on and around the ash disposal facility and loading stockpiled emergency ash into the inloading hoppers.

c) 1x 140G CAT Motor grader

A grader is used for final levelling and shaping of the platforms, advancing frontstack slope, side slopes, backstack and rehabilitation of top soil on the final surfaces of the ash heap. Additionally, it is used for minor cleaning operations on the spreader and stacker working platforms as well as for grading of roads etc.

d) 3x 10m<sup>3</sup> MAN Tippers

These are used for hauling and placing topsoil and rehabilitation soil on the ash heap and for trucking ash from the emergency ashing area to the ash disposal facility only when absolutely necessary.

e) 1x 18000 litre Water tanker

The water tanker is used for dust suppression of working areas, roads, and washing down of the mechanical plant etc.

The top of the ash heap slopes from the conveyor discharge side to the opposite side at a flat slope (to try avoid scouring and erosion). Any runoff then travels down the embankment to an open concrete channel running along the toe line of the ash heap. Of the 920 hectares allocated for ash disposal, about 300 hectares have already been covered at the existing ash disposal facility.

Water (sourced from pollution control dams or from the power station) is used to suppress airborne ash on the advance slope of the ash dump. In general, after 2 days from the placement of the ash onto the pile, the ash "solidifies" using water from the dust suppression, leaving a fairly hard, compacted medium. The ash disposal facility is covered daily with a 50 mm thick layer of soil / sandy material while the final rehabilitation cover consists of 300 mm thick topsoil material with seeding for grass and manual planting of trees particularly fever trees as they grow well in this kind of environment.



Ash is transported with a conveyor belt from the power station to the ash disposal facility



Coal fly ash dispersing into the environment (photo on the left) and view from the top of the ash dump



Ash after being sprayed with water (photo on the left) and ash disposal area after rehabilitation

**Figure 6: Activities and Dust Management at the Ash Disposal Facility**

### 3.2 New Ash Disposal Facility

A new ash disposal facility will need to have the following typical infrastructure constructed:

- Conveyor system for ash transportation
- Drainage system
- Site office
- Workshop
- Contractors' yard
- Water supply pipelines, for ash/dust suppression
- Ash water return dams
- Storm water control dams (*these will be constructed as per the GN 704 of the National Water Act (No. 36 of 1998)*)
- Storm water control berms
- Access roads to, on and around the facility. *These roads include temporary roads during construction and permanent roads during the operation.*



- Ash disposal site – *The design of this site will be dependent on aspects such as the results of the ash classification study, topography, etc.*

The details of the above infrastructure have not been determined at this stage because it is dependent on the site that is finally chosen for the establishment of the ash disposal facility.

Additionally, in order for the ash disposal facility to be constructed, a construction camp will need to be established although the details are also not available at this stage.

## 4 PROJECT ALTERNATIVES

In terms of the EIA Regulations, Section 28 (1)(c) feasible alternatives are required to be considered as part of the environmental investigations. In addition, the obligation that alternatives are investigated is also a requirement of Section 24(4) of the National Environmental Management Act (No 107 of 1998) (as amended).

An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity (as defined in Government Notice R.543 of the EIA Regulations, 2010), which may include alternatives to:

- a) the property on which or location where it is proposed to undertake the activity
- b) the design or layout of the activity

### 4.1 Site Alternatives

#### 4.1.1 Methodology for the Selection and Sensitivity Analysis of the Site Alternatives

An 8 km radius within the Matimba Power Station (which is the source of the ash) as the centre point was selected as the study area. A sensitivity mapping exercise was undertaken for the study area in order to establish the best possible sites to evaluate during EIA phase. The purpose of such an exercise was to identify suitable areas within the study area that could accommodate the ash disposal facility and to pro-actively identify sensitive areas that should ideally be avoided.

The complexity of projects is often such that sensitivity analyses are required to determine the most suitable location for the proposed activities, in the form of site alternatives. These sensitivity analyses are aimed at integrating the findings of various specialist studies into a single matrix based on standardised impact ratings. These ratings (Table 8) can be quantified, linked to the spatial component of each attribute (Figure 7), and then displayed thematically. The figure adjacent to the composite sensitivity score in Figure 7 is therefore, the sum of the values contained in the preceding figures that were assigned by the various specialists.

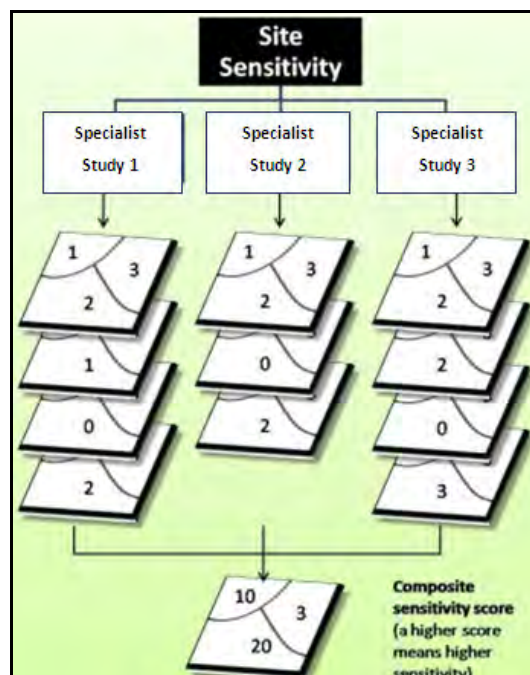


Figure 7: Schematic View of Consolidated Sensitivity Analysis

The impact ratings utilised for the proposed Matimba ash disposal facility and their associated values are shown in Table 8.

**Table 8: Impact Rating and Associated Score values**

1	Low	Impact insignificant - Preferred area for development
3	Medium	Impact of medium significance – mitigation likely to reduce impact.
5	High	Impact severe – unlikely to be adequately mitigated
- <sup>1</sup>	Extremely high	Impact extremely severe - area not developable due to inherent fatal flaws.

The specialist areas that were included in the study are:

- Biodiversity;
- Geohydrology;
- Air Quality;
- Landfill Design;
- Social;
- Hydrology;
- Heritage;
- Visual;
- Surface Water; and
- Noise.

Each of the specialists prepared a GIS data layer based on their respective assessments, assigning values to each area mapped out. Due to the variety of specialist areas under investigation, the specialist assessments differed significantly in their ratings, which required cross reference to a numeric, standardised sensitivity score to allow for spatial representation of the consolidated findings.

<sup>1</sup> These areas were displayed separately to the sensitivity layer as they were considered inherent fatal flaws by the project team, regardless of the sensitivity assessment findings.

Figure 8 shows the standardisation of the ecological (biodiversity) sensitivity layers, including a table showing rating and the corresponding sensitivity score that was assigned.

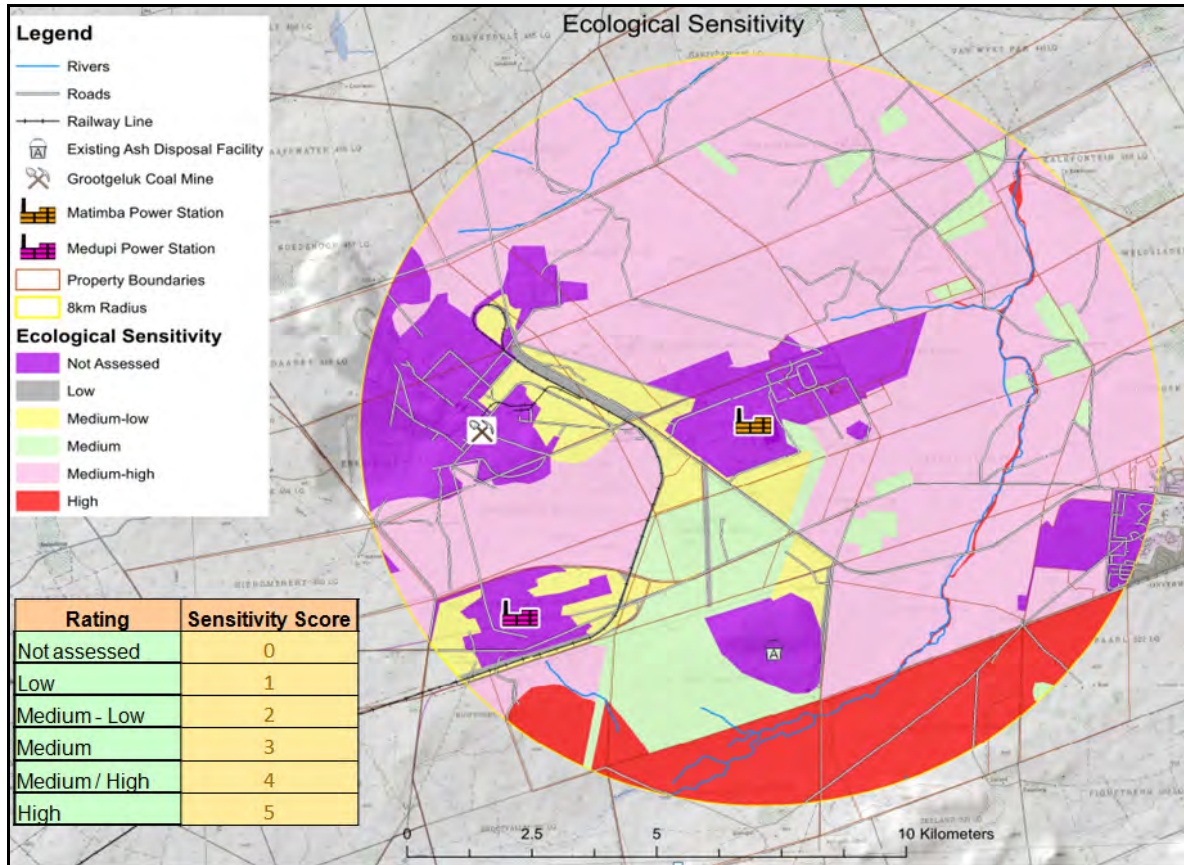


Figure 8: Ecological Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 9 shows the standardisation of the geo-hydrological sensitivity layer, including a table showing rating and the corresponding sensitivity score that was assigned.

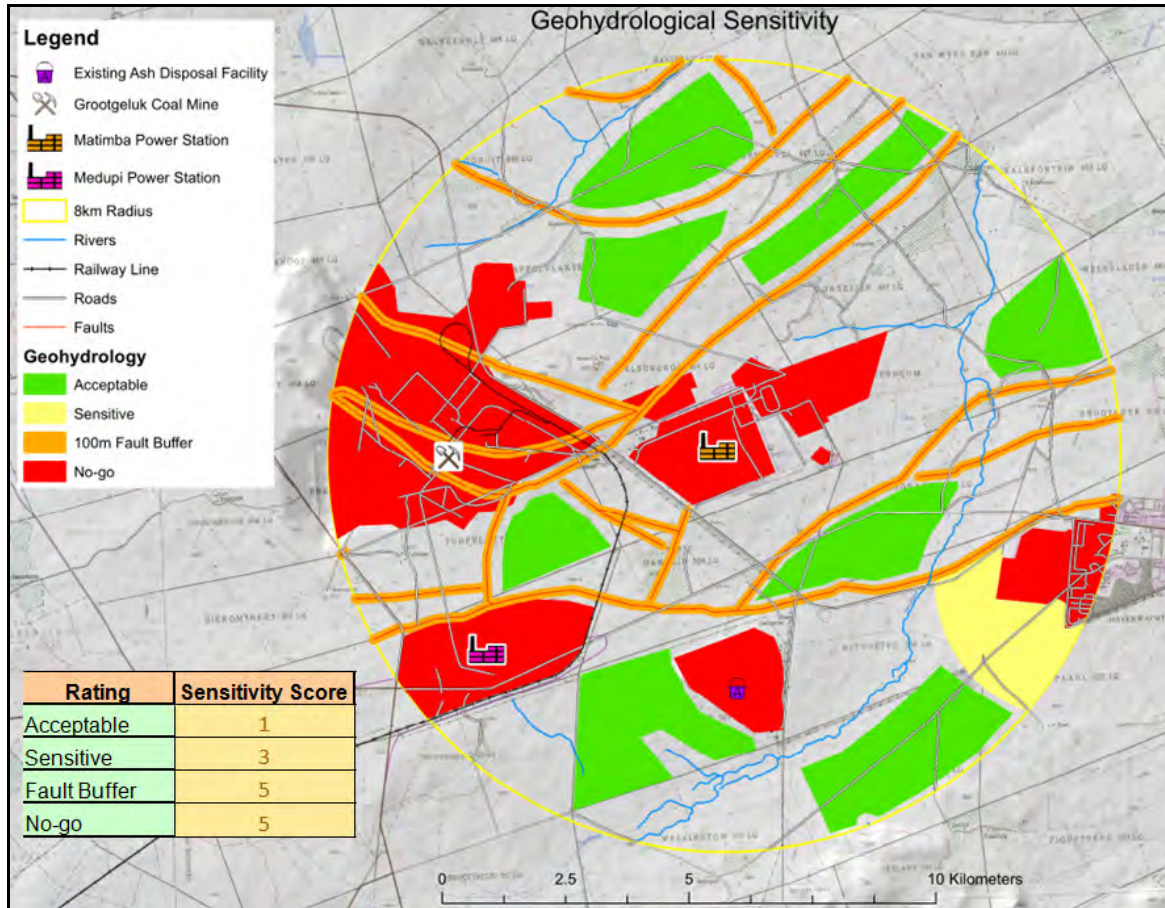


Figure 9: Geohydrological Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 10 shows landfill design sensitivity including a table showing rating and the corresponding sensitivity score that was assigned.

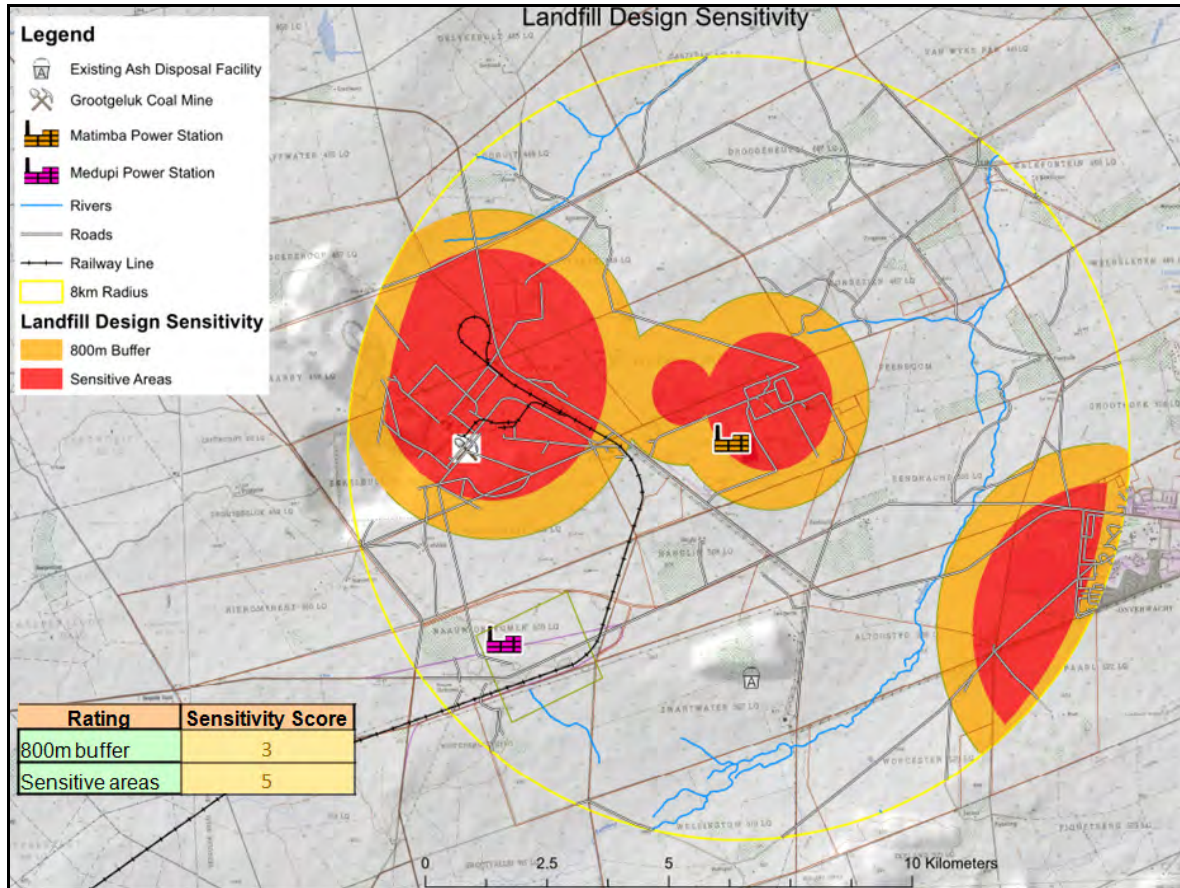


Figure 10: Landfill Design Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 11 highlights sensitivity from an air quality perspective and includes a table showing rating and the corresponding sensitivity score that was assigned.

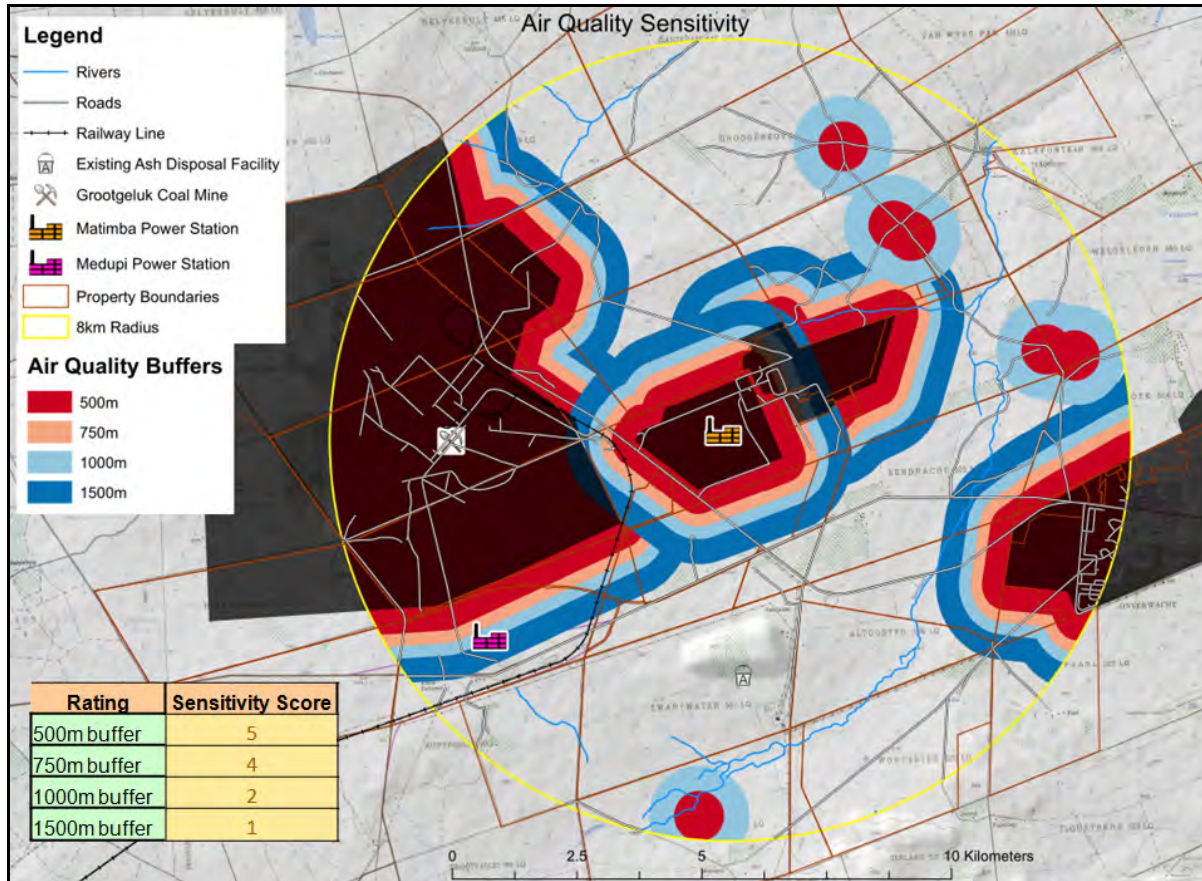


Figure 11: Air Quality Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 12 shows sensitivity from the social opinion specialist study that considered potentially affected communities, farms, labour and business. It includes a table showing rating and the corresponding sensitivity score that was assigned. Potentially affected receptors are not included in the table, as potentially sensitive receptors are conceptual, based on desktop information and therefore the footprint occupied by these areas could not be accurately delineated. They have therefore been included in the final sensitivity map as a separate layer in order to ensure that they are taken into account.

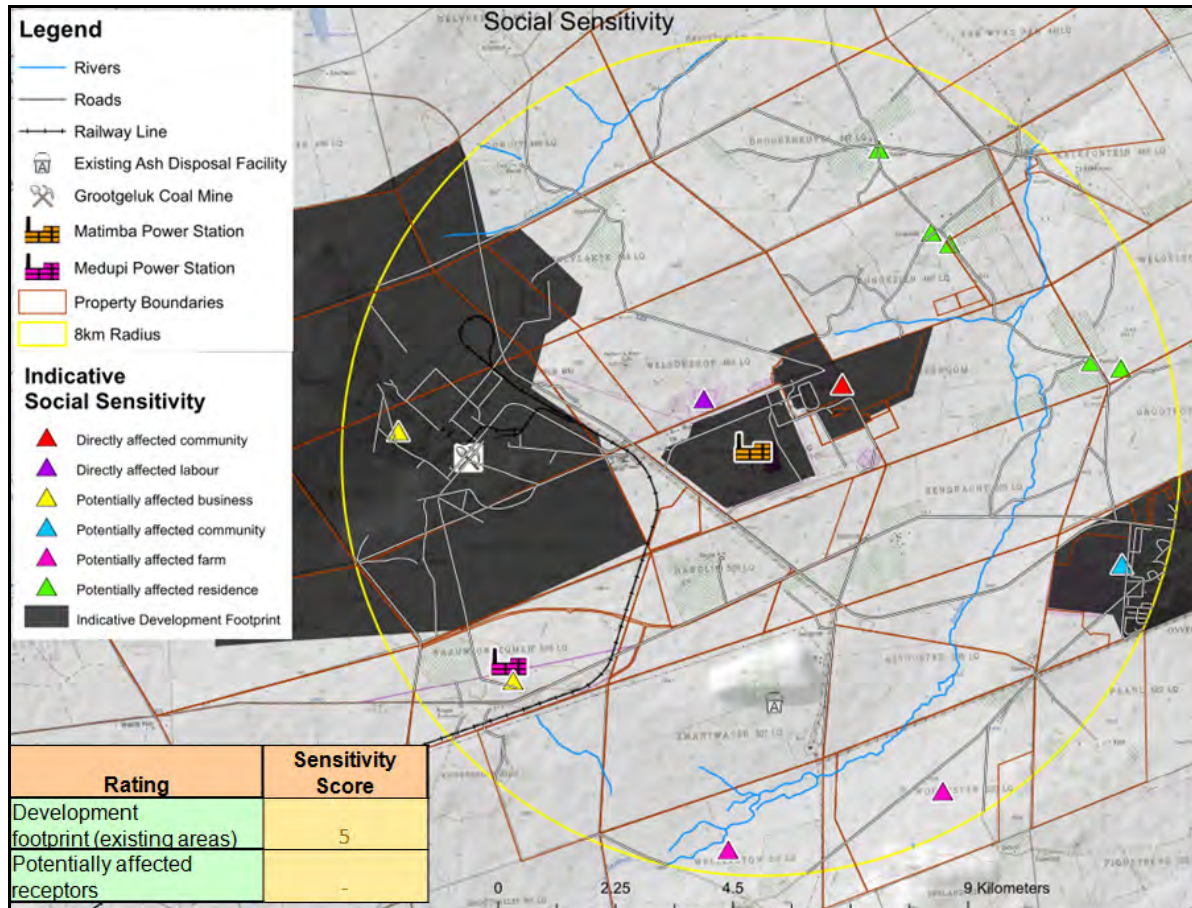


Figure 12: Social Sensitivity Map and Corresponding Standardised Sensitivity Score



Figure 13 highlights sensitivity from a hydrological perspective and includes a table showing rating and the corresponding sensitivity score that was assigned.

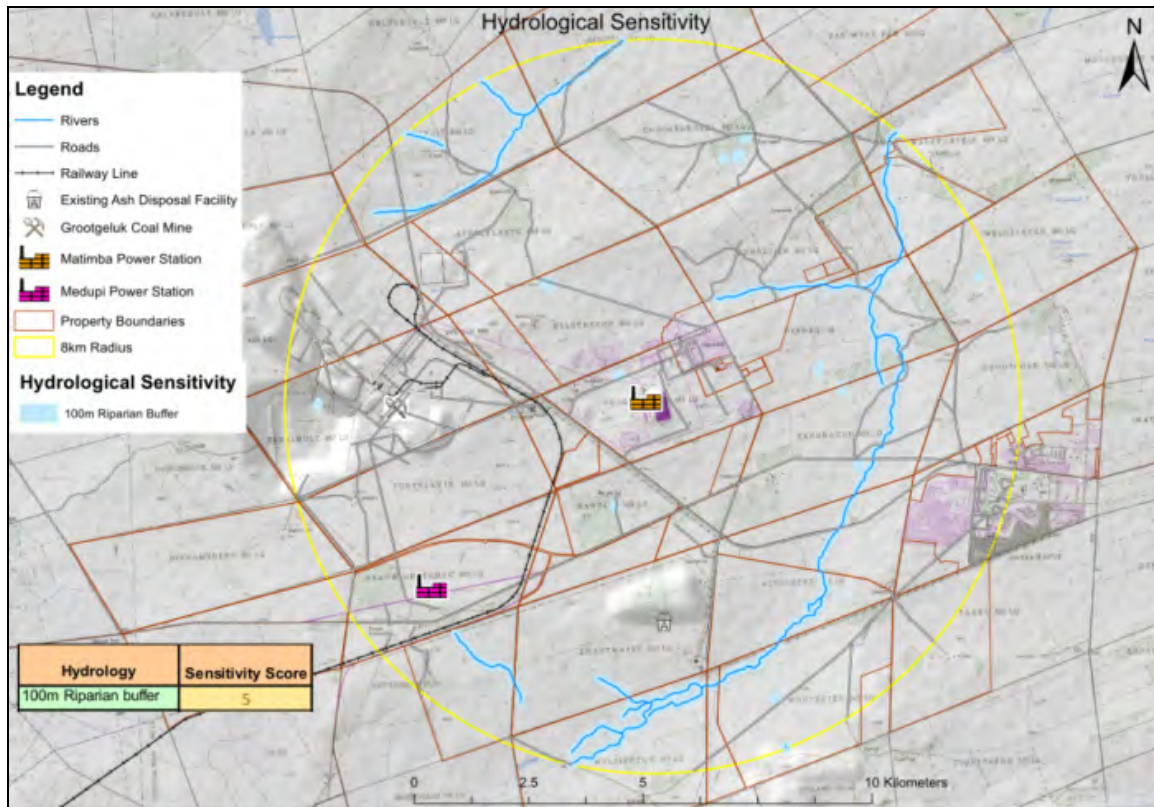


Figure 13: Hydrological Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 14 shows sensitivity from a heritage perspective and includes a table showing rating and the corresponding sensitivity score that was assigned. Potentially affected heritage sites are not included in the table, as they are not of a size which will be accurately reflected in the sensitivity analysis. They have therefore, been included in the final sensitivity map as a separate layer in order to ensure that they are taken into account. The Nelson’s Kop site is of primary importance as a Category 1 site, and as such has been included in the fatal flaw layer (refer to Table 8).

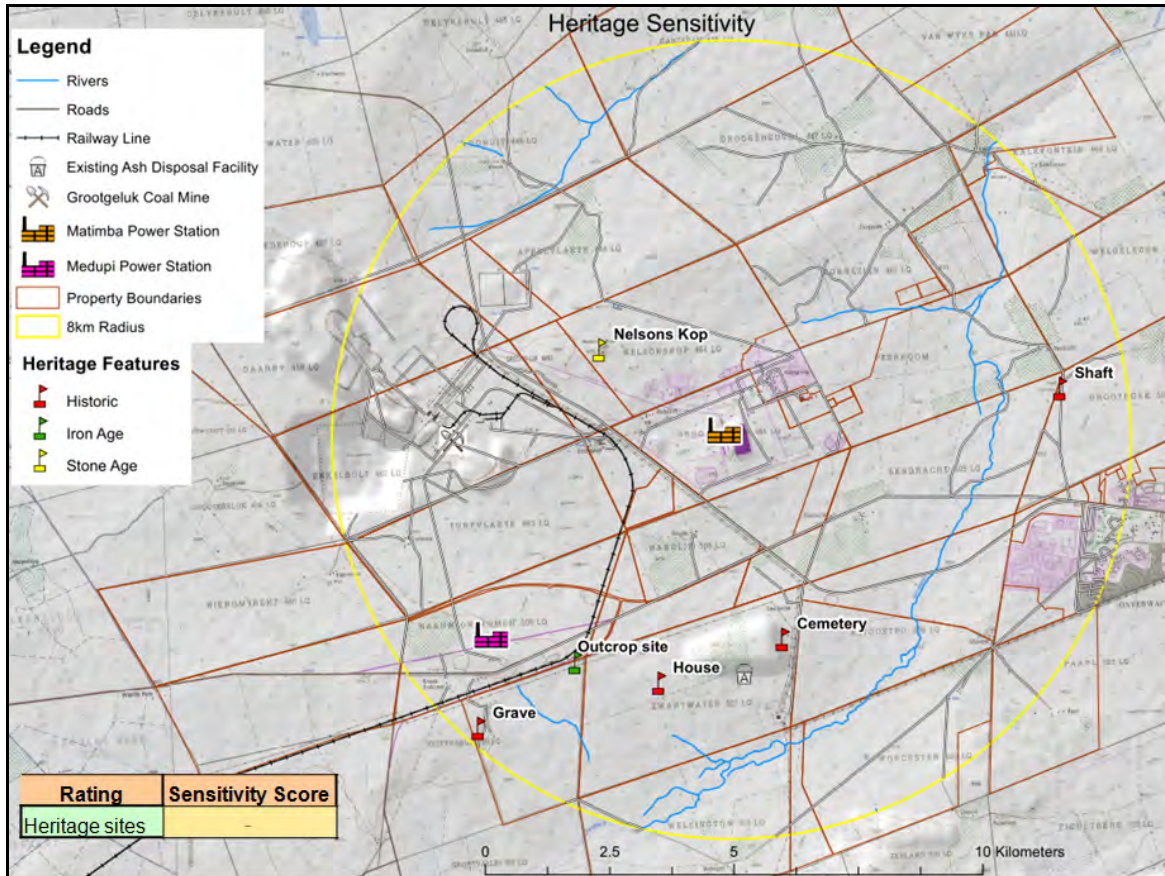


Figure 14: Heritage Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 15 highlights sensitivity from a visual impact perspective and includes a table showing rating and the corresponding sensitivity score that was assigned.

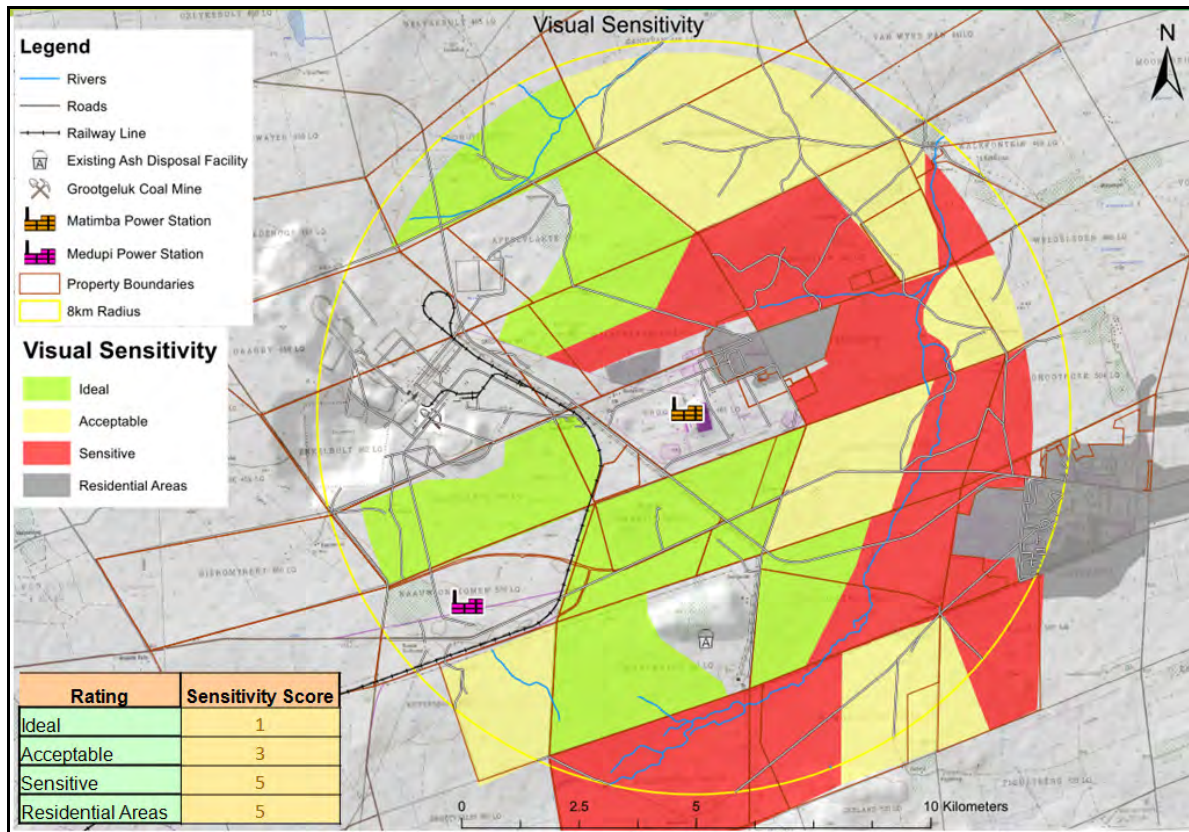


Figure 15: Visual Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 16 shows sensitivity from a surface water perspective and includes a table showing rating and the corresponding sensitivity score that was assigned.

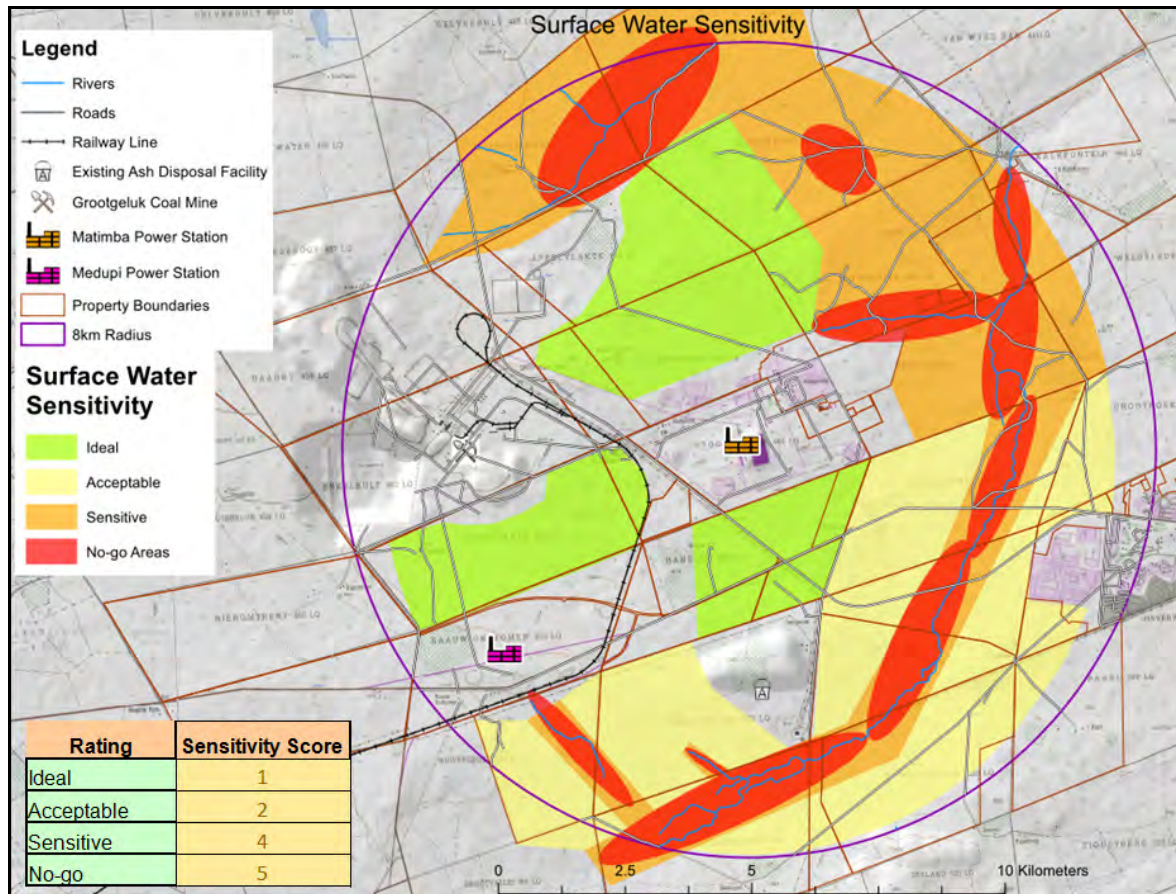
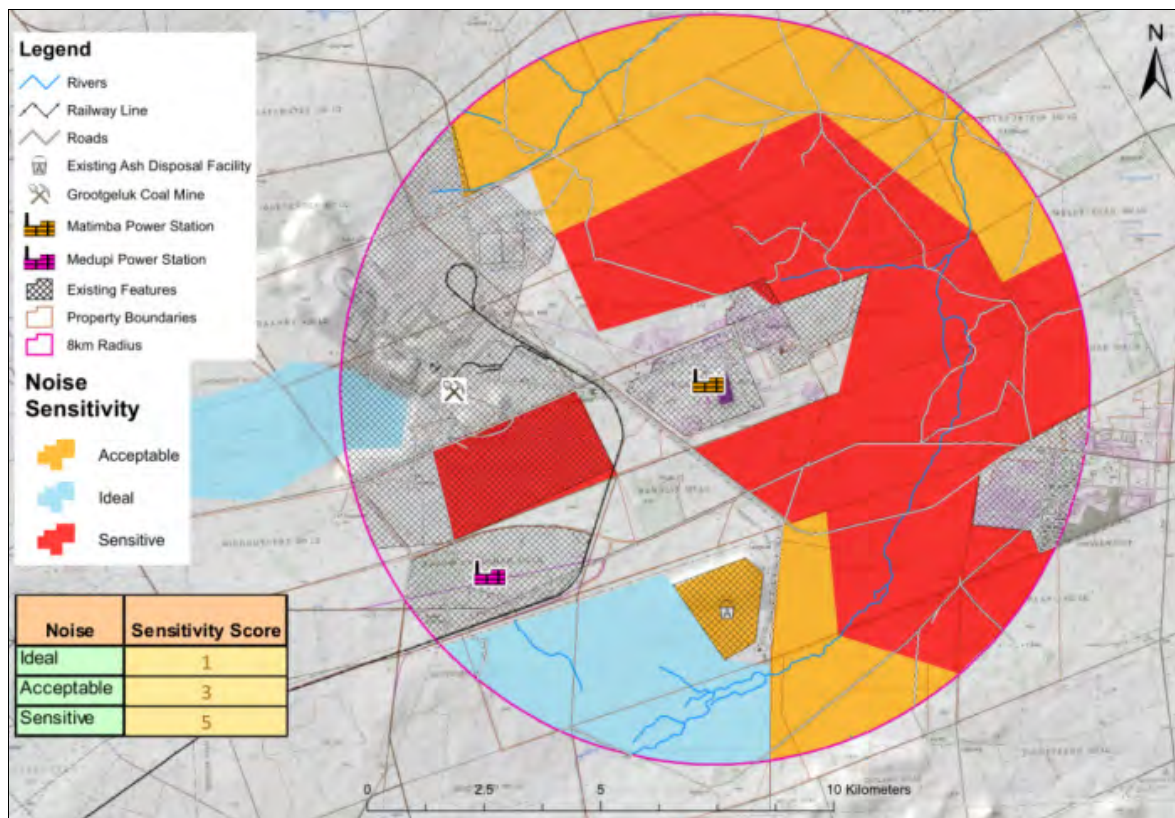


Figure 16: Surface Water Sensitivity Map and Corresponding Standardised Sensitivity Score

Figure 17 shows sensitivity from a noise perspective and includes a table showing rating and the corresponding sensitivity score that was assigned based on Table 9 below.

**Table 9: Noise Sensitivity Zone and Descriptor Details**

Sensitivity Descriptor	Zone	Details of Descriptor
<b>Sensitive</b>		i) Area where development of the ash disposal facility is likely to have a significant impact on a large number of noise sensitive receptors and should not be considered. ii) Ash disposal facility within a 3000m distance from a HDNS receptor.
<b>Acceptable</b>		i) Area where development of the ash disposal facility is likely to have only an impact on a moderate number of noise sensitive receptors and could be considered. ii) Ash disposal facility at distance greater than 3000m from a HDNS receptor.
<b>Ideal</b>		i) Area where development of the ash disposal facility will have an impact on very few noise sensitive receptors and should be given preference. ii) Ash disposal facility at distance greater than 3000m from a HDNS receptor.



**Figure 17: Noise Sensitivity Map and Corresponding Standardised Sensitivity Score**

Table 10 shows a summary of the figures above that allowed for data integration and the development of a consolidated sensitivity map. It should be noted that all ratings were weighted equally for the purposes of this assessment.

**Table 10: Summary and Ranking of Sensitivity Values for each Specialist Domain**

Rating Descriptions	Rating Values									
Specialist Domain	Biodiversity	Geo-hydrology	Air Quality	Landfill Design	Social	Hydrology	Heritage	Visual	Surface Water	Noise
Low	1	1	1	-	-	-	-	1	1	1
Medium - Low	2	-	2	-	-	-	-	-	-	-
Medium	3	3	-	3	-	-	-	3	3	3
Medium / High	4	-	4	-	-	-	-	-	-	-
High	5	5	5	5	5	5	5	5	5	5

An extract of the database which represents the model is shown in Figure 18. This represents the values and standardised sensitivity scores of each of the sensitivity maps. The [FINAL] score was achieved by summing the following fields derived from the various specialist assessments:

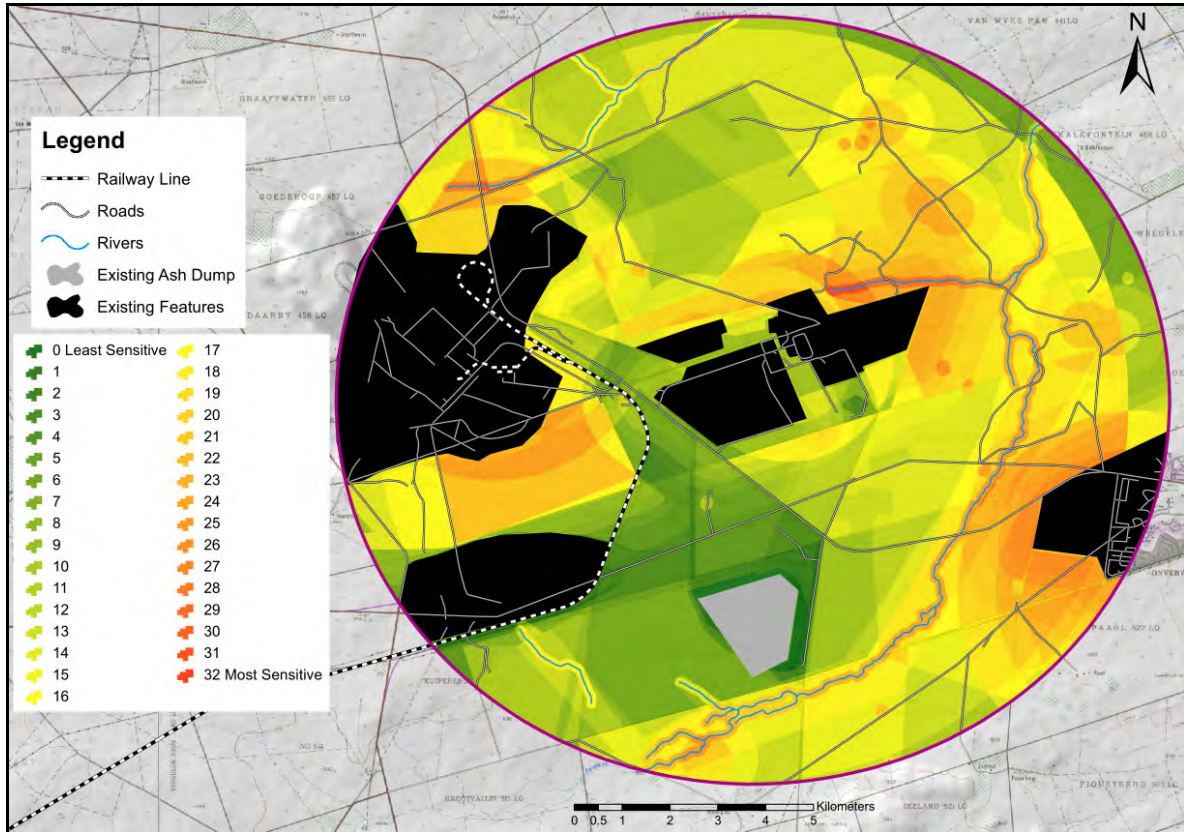
- [soc\_sens]
- [air\_sens],
- [eco\_sens]
- [geoh\_sens]
- [hydro\_sens]
- [vis\_sens]
- [swater\_sen]
- [eng\_sens]
- [noise\_sens]

The screenshot shows a table titled 'FINAL SENSITIVITY' with the following columns: FID, Shape \*, soc\_sens, air\_sens, eco\_sens, geoh\_sens, hydro\_sens, vis\_sens, swater\_sen, eng\_sens, noise\_sens, and FINAL. The data rows show various polygons with their respective sensitivity scores across these domains, and a final score calculated as the sum of the specialist scores.

FID	Shape *	soc_sens	air_sens	eco_sens	geoh_sens	hydro_sens	vis_sens	swater_sen	eng_sens	noise_sens	FINAL
507	Polygon	0	5	4	0	5	5	5	3	5	32
608	Polygon	0	5	4	0	5	5	5	3	5	32
777	Polygon	0	5	4	0	5	5	5	3	5	32
789	Polygon	0	5	4	0	5	5	5	3	5	32
508	Polygon	0	4	4	0	5	5	5	3	5	31
607	Polygon	0	4	4	0	5	5	5	3	5	31
683	Polygon	0	4	4	0	5	5	5	3	5	31
777	Polygon	0	4	4	0	5	5	5	3	5	31
777	Polygon	0	5	4	0	5	5	4	3	5	31
789	Polygon	0	4	4	0	5	5	5	3	5	31
789	Polygon	0	5	4	0	5	5	4	3	5	31
508	Polygon	5	5	4	0	5	1	4	3	3	30
607	Polygon	5	5	4	0	0	5	1	5	5	30
683	Polygon	0	4	4	0	5	5	4	3	5	30
688	Polygon	5	5	4	0	0	5	1	5	5	30
777	Polygon	0	4	4	0	5	5	4	3	5	30

**Figure 18: Extract from Attribute Table of the Final Consolidated Sensitivity Layer**

These ratings were integrated into a new data layer. Based on the values in the [FINAL] field, a graduated thematic map (Figure 19) was produced as an indication of consolidated or composite environmental sensitivity of the site, where sensitivity is considered between 0 (least sensitive) and 32 (most sensitive).



**Figure 19: Graduated Sensitivity Map**

In line with project requirements, sensitivity was further displayed in quantified groupings of low sensitivity (sensitivity scores of between 0 and 11), medium sensitivity (sensitivity scores of between 12 and 18) and high sensitivity (sensitivity scores of between 19 and 32). Existing features (including buildings, the coal mine, transport and utility networks as well as communities), fatal flaws and two proposed site alternatives that match the required footprint for the project specifications were overlaid onto the resultant quantified sensitivity map (refer to Figure 21). Areas where the proposed alternatives breach or intersect with the identified fatal flaw layer are indicated by red circles (refer to Figure 20).

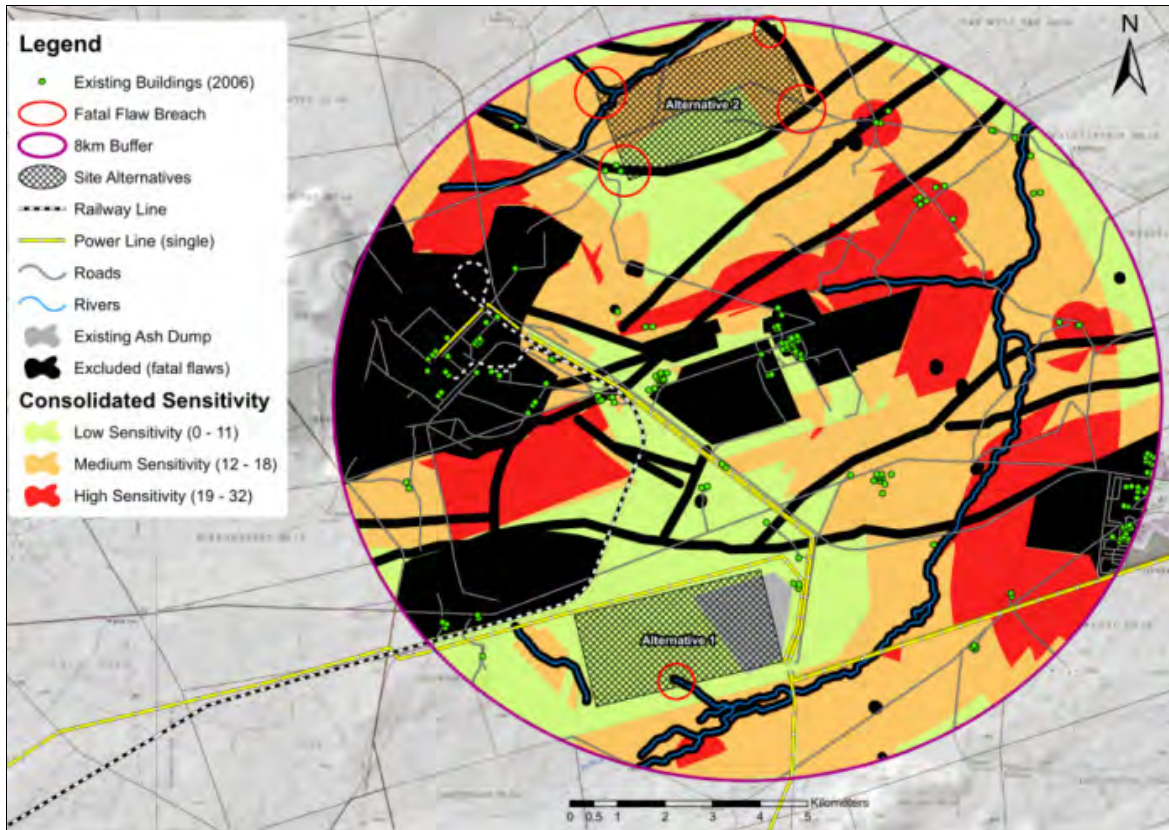


Figure 20: Sensitivity Map Including Existing Features, Fatal Flaws & Proposed Alternatives

#### 4.1.2 Selected Site Alternatives

Currently, two site alternatives (refer to Figure 21) are under consideration for the construction of the ash disposal facility.

**a) Site 1**

This site is located in the Southern section of the 8 km radius study area, on the farm Zwartwater 507 LQ which is owned by Eskom.

**b) Site 2**

This site is located in the northern section of the 8 km radius study area and straddles four different farms namely:

**Table 11: Farm Owners - Site Alternative 2**

Farm	Portion No.	Owner
Vooruit 449 LQ	-	Exxaro Coal ( Pty) Ltd
Droogeheuvel 447LQ	-	Triple M Game Ranch
Ganzepan 446 LQ	-	Susara Maria Gouws
Appelvlakte 448 LQ	0 & 2	Exxaro Coal ( Pty) Ltd
Appelvlakte 448 LQ	1	Lephalale Local Municipality

NB: The two site alternatives identified will be assessed further during the EIA phase.



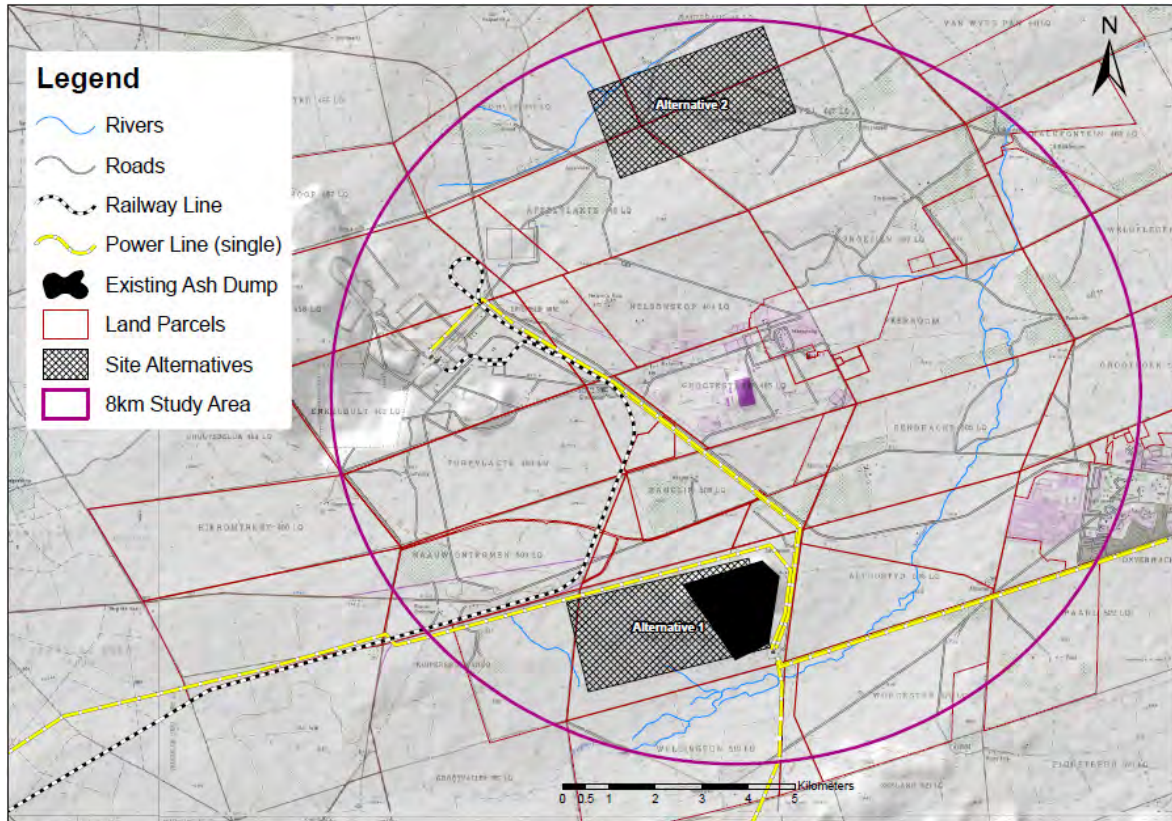


Figure 21: Map showing Selected Site Alternatives

## 4.2 Design or Layout Alternatives

Two layout alternatives are possible for the proposed ash disposal facility:

### 4.2.1 Extending the Existing Ash Disposal Facility

The existing ash disposal facility can be utilized for ash disposal by placing future ash on top of the existing ash pile (“piggy-backing”). This option allows the Matimba power station to accommodate the ashing requirements for its remaining life (44 years) and no substantial new infrastructure will be required to be established.

### 4.2.2 Constructing a New Ash Disposal facility

A new ash disposal facility could be established to cater for the future ashing requirements for the remaining life (44 years) of the Matimba Power Station. For this option, infrastructure will need to be established from the start to enable the operation of the ash disposal facility.

## 4.3 Do-nothing Alternative

Matimba Power Station produces approximately 4.8 million tons of ash annually and which is currently being disposed by means of ‘dry ashing’. A new ash disposal facility is required in order to accommodate the ashing requirements of the power station for the next 44 years. If this project does not proceed, Matimba Power Station will be unable to dispose ash in the existing disposal facility due to space limitations. Additionally, a new ash disposal facility which is sufficient for the remaining life span of the power station is required. The new ash disposal facility must comply with the National Environmental Management: Waste Act (NEMWA), Act 59 of 2008

and the EIA Regulations (2010) promulgated under the National Environmental Management Act (NEMA) Act 107 of 1998, (as amended).

## 5 PUBLIC PARTICIPATION

One of the general objectives of integrated environmental management laid down in Section 23(2)(d) of NEMA is to “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment”. An inadequate and non-transparent public participation process (PPP) has the potential to provide a negative decision and perception regarding the proposed project.

The EIA Regulations (2010) place a lot of emphasis on the public participation process and have been revised to contain comprehensive guidelines to involve the public in the EIA process.

The primary aims of the public participation process include:

- Meaningful and timeous participation of interested and affected parties (I&APs);
- Identification of issues and concerns of key stakeholders and I&APs with regards to the proposed development, i.e. focus on important issues;
- Promotion of transparency and an understanding of the proposed project and its potential environmental (social and biophysical) impacts;
- Accountability for information used for decision-making;
- Serving as a structure for liaison and communication with I&APs;
- Assisting in identifying potential environmental (social and biophysical) impacts associated with the proposed development; and
- Inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process).

The minimum requirements for public participation as contained in Chapter 6 of the EIA Regulations (2010) are contained hereunder and are discussed in detail in subsequent sections:

Public Participation Requirements according to Section 54 - 57 of GN R 543	Specific Actions to Ensure Compliance
<b>Section 54 (2) (b) – The person conducting a public participation process must give written notice to the owner or person in control of that land if the owner is not the owner or person in control of the land; owners and occupiers of land adjacent to the site municipal councillor; municipality; organ of state having jurisdiction and any other party required by the competent authority.</b>	Compile introductory letters to owners, adjacent landowners, municipal councillor, municipality and organ of state.
<b>Section 54 (2) (a) – Fix a notice board at the site boundary or any alternative site applicable to the application</b>	The notice board accordingly must – (a) give details of the application subject to public participation. (b) state – i. that the application has been submitted to the CA. ii. whether basic assessment or scoping procedures are being applied for. iii. the nature and location of the activity to which the application relates. iv. where further information on the application or activity can be obtained. v. the manner in which and the person to whom representation in respect of the application may be made. The notice board must be – (a) Of a size of at least 60cm by 42cm. (b) Display the required information in lettering and format.
<b>Section 54 (2) (c) &amp; (d) – Place an advert in one local</b>	An advert will be placed in the local newspaper/s and any other

Public Participation Requirements according to Section 54 - 57 of GN R 543	Specific Actions to Ensure Compliance
newspaper or official <i>Gazette</i> and or placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality.	paper decided by the applicant to advertise the availability of the draft ESR and EIAR for review and public meetings as well as advertising the environmental authorisation.
Section 55 (1) – An EAP managing a application must open and maintain a register which contains the names, contact details and addresses of – (a) All persons who as a consequence of the PPP have submitted written comments or attended meetings (b) All persons after completion of the PPP have requested in writing their names to be placed on a register (c) All organs of state which have jurisdiction in respect of the application.	Comprehensive I&AP database/register will be opened and maintained.
Section 56 (1) a registered interested and affected party (I&AP) is entitled to comment, in writing, on all written submissions; including draft reports made to the CA within the timeframes that have been set by the CA or any extension of a timeframe agreed to by the EAP or applicant.	According to Section 56 (8) a timeframe of 40 days is provided to I&APs for comments on draft and final reports.
Section 56 (5) Registered I&APs must submit comments on draft reports to the EAP.	According to Section 56 (8) a timeframe of 40 days is provided to I&APs for comments on draft reports. All issues will be recorded in a Comments and Response Report.
Section 56 (6) Comments on final reports must be provided to the CA and a copy provided to the EAP.	A timeframe of 21 days is provided for registered I&APs to comment on the final reports. All comments must be forwarded to the CA and a copy furnished to the EAP.
Section 57 (1) The EAP must ensure that the comments of I&APs are recorded in reports and written comments including record of meetings are attached to the report submitted to the CA.	Compilation of Issues Trail/Comments and Responses Report that will form part of final reports.

## 5.1 Consultation with the Competent Authority

The competent authority and commenting authority issuing decisions regarding the project as well as consultation to date are presented in below.

**Table 12: Competent and Commenting Authority associated with the Project**

Authority	Role	License / Approval	Consultation to date
Department of Environmental Affairs (DEA)	Competent Authority for Integrated Licensing process	Integrated Environmental Authorisation	<ol style="list-style-type: none"> <li>Confirmation of process to be undertaken i.e. integrated waste and EIA process</li> <li>Submission and acceptance of integrated application form (see <b>Appendix B</b>)</li> </ol>

Authority	Role	License / Approval	Consultation to date
Limpopo Department of Economic Development, Environment and Tourism (LDEDET)	Commenting Authority for integrated Licensing process		1. Notification of the integrated waste and EIA process

## 5.2 Overview of the PP Process undertaken / to be undertaken during the Environmental Scoping Study

The public participation process (PPP) undertaken / to be undertaken during the Environmental Scoping Study is presented in Figure 22.

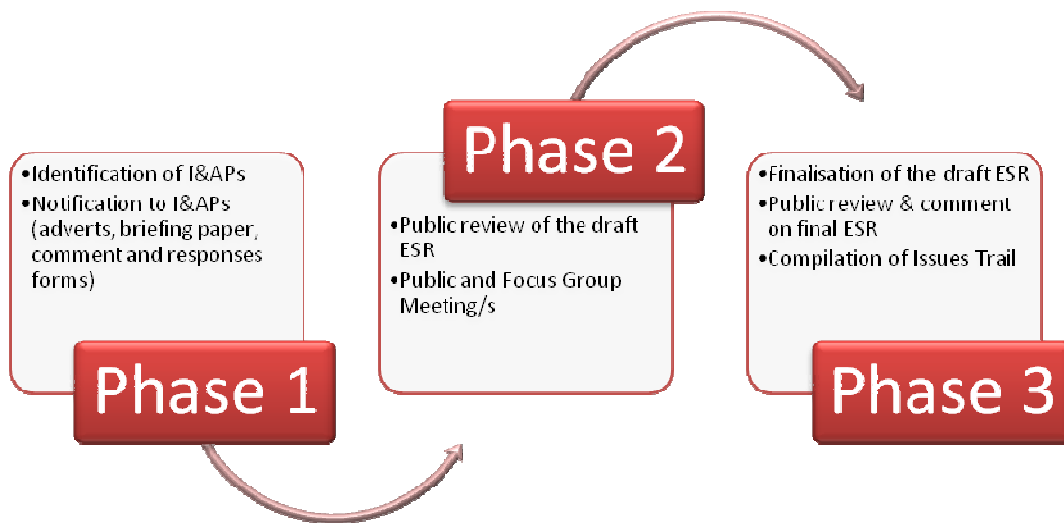


Figure 22: Key phases in the PP Process undertaken / to be undertaken during the ESS

### 5.2.1 Phase I Public Participation

- **Identification of Interested and Affected Parties (I&APs) and Stakeholders**

An important step in the public participation process entailed the identification of key stakeholders and I&APs, including:

- Limpopo Provincial Government:
  - ✓ Department of Roads and Transport
  - ✓ Department of Public Works
  - ✓ Department of Mineral Resources
  - ✓ Department of Water Affairs
  - ✓ Department of Labour
  - ✓ Department of Agriculture
  - ✓ Department of Health and Social Development
- Local Government and other Stakeholders
  - ✓ Lephalale Local Municipality
  - ✓ Waterberg District Municipality

- ✓ Ward councillors;
- ✓ South African Heritage Resource Association (SAHRA)
- ✓ Neighbouring property owners/landowners;
- ✓ Farmers Associations; and
- ✓ Environmental interest groups and NGOs.

The identification of additional I&APs will be undertaken through existing contacts, responses to newspaper advertisements, and networking to identify key I&APs.

All I&AP information (including contact details), together with dates and details of consultations and a record of all issues raised is recorded within a comprehensive database of I&APs (refer to **Appendix C**). This database is updated on an on-going basis throughout the project process. Consultations, in the form of telephone, faxes and letters will / have been undertaken with individuals, businesses, institutions and organisations, including the following:

- **Advertising**

In compliance with the EIA Regulations (2010), site notices (refer to **Appendix D**) advertising the EIA process for the proposed project were placed at the following public places:

- ✓ Marapong Post Office
- ✓ Marapong Clinic
- ✓ Marapong Public Library
- ✓ Lephalale Public Library
- ✓ Lephalale Municipal Offices
- ✓ Mogol Social Club
- ✓ On the boundaries of the existing ash disposal facility
- ✓ Corner of Medupi Road & the road going to Marapong from town

Interested and affected parties (I&APs) were requested to register their interest in the project and become involved in the EIA process. The primary aim of these advertisements is to ensure that the widest group of I&APs possible is informed and invited to provide input and questions and comments on the project.

- **Briefing Paper**

A briefing paper for the project was compiled in English (refer to **Appendix E**). The aim of this document was to provide a brief outline of the proposed project, provide preliminary details regarding the Scoping and EIA process, and explain how I&APs could become involved in the project. The briefing paper was distributed to all identified stakeholders, together with a registration/comment sheet, inviting I&APs to submit details of any issues and concerns.

## **5.2.2 Phase II Public Participation**

- **Consultation and Public Involvement**

Through consultations, issues for inclusion within the EIA will be identified and confirmed. Telephonic consultation, a public meeting/s as well as focus group meeting/s (FGMs) with I&APs and key stakeholders will be undertaken in order to identify additional key issues, needs and priorities for input into the EIA study for the proposed project. Copies of minutes held during the review of the draft Environmental Scoping Report (ESR) for all formal public involvement meetings held during the ESS will be included in the final ESR.

- **Public Review of the draft ESR**

An advert was placed in the *Rise n Shine* and *Mogol Post* informing I&APs of the application and the availability of the draft ESR and Plan of Study for EIA for review and comment. The advert appeared on **26 April 2013** in the

*Rise n Shine* and *Mogol Post*. A copy of the advertisements is included in **Appendix F**. Additionally, all registered I&APs were notified of the availability of the report in writing.

The draft ESR, together with the Plan of Study for EIA is being made available for authority and public review for 40 calendar days from **29 April 2013** to **09 June 2013**. In addition, the report will also be made available at the following public locations (which are all readily accessible to I&APs) within the study area:

- Offices of Matimba Power Station (Nelson Mandela Drive, Lephalale)
- Lephalale Public Library (Lephalale Municipality offices, corner Joe Slovo & Douwater Roads)
- Marapong Community Library (1456 Setlhora Street, Marapong)
- Manketti Lodge (Mogol road, Lephalale)
- Office of Royal HaskoningDHV (78 Kalkoen Street, Monument Park, Pretoria)
- Royal HaskoningDHV website (<http://www.rhdhv.co.za/pages/services/environmental/current-projects.php>)
- Eskom Holdings SOC (Ltd) website ([www.eskom.co.za/eia](http://www.eskom.co.za/eia))

Hard and soft copies of the reports will be forwarded to:

- Department of Water Affairs
- Limpopo Department of Economic Development, Environment and Tourism
- Lephalale Local Municipality
- Waterberg District Municipality
- SAHRA – uploaded onto the SAHRIS online system

- **Public Meeting / Open House Session**

The primary aim of a public meeting / open house session will be to:

- provide I&APs and stakeholders with information regarding the proposed project and associated infrastructure;
- provide I&APs and stakeholders with information regarding the EIA process;
- provide an opportunity for I&APs and stakeholders to seek clarity on the project;
- record issues and concerns raised; and
- provide a forum for interaction with the project team.

This meeting will be advertised in the *Mogol Post* and *Rise n Shine* newspapers. Registered I&APs and stakeholders will be invited to attend the public meeting by individualised letters. Copies of the minutes of meeting will be included in the final Environmental Scoping Report.

- **Focus Group Meeting**

This meeting will be held with groups that have similar interests in the project, such as the local authorities, landowner's associations, etc. The main aims of this meeting will be to provide stakeholders with information regarding the proposed project and provide them with the opportunity to raise any comments, issues or concerns regarding the proposed project.

### **5.2.3 Phase III Public Participation**

- **Public Review of the Final ESR**

In order to give effect to regulation 56 (2) of the EIA Regulations (2010), before submitting the final ESR to the DEA, the EAP must give registered I&APs access to, an opportunity to comment on the report in writing within 21 days.

- **Issues Trail**

All issues, comments and concerns raised during the public participation process will be compiled into an Issues Trail that will form part of the final ESR. The Issues Trail will be updated on an on-going basis.

### **5.3 Submission of Final Environmental Scoping Report**

The submission of the final ESR and Plan of Study for EIA is the last stage of the Environmental Scoping Phase for the proposed project. The final ESR will be submitted to DEA for review and decision-making.



## 6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

### 6.1 Biophysical Environment

#### 6.1.1 *Locality*

The proposed project falls within Limpopo Province within the Waterberg District Municipality (DC 36) which consists of six local municipalities namely: Mookgopong, Bela Bela, Modimolle, Thabazimbi, Lephalale and Mogalakwena. The study area for the proposed project is located in the Lephalale Local Municipality which is the largest in the province measuring 14000 km<sup>2</sup>. The Lephalale Local Municipality is located in the north western section of the District Municipality and is bordered by the local municipalities of Thabazimbi to the south west, Modimolle to the south east, Mogalakwena to the east and Blouberg to the north<sup>2</sup>. Refer to Figure 23 for the provincial map.

#### 6.1.2 *Climate and Local Weather Conditions*

The study area is situated in a semi-arid rainfall region that is characterized by cool, dry winters (May to August) and warm, wet summers (October to March), with April and September being transition months.

- **Rainfall**

The study area lies in the summer rainfall region (as such rainfall in the area is highly seasonal) receiving an annual average of approximately 350 mm to 400 mm. Most of this rainfall occurs in the months of December, January and February<sup>3</sup>.

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<sup>2</sup> Source: Lephalale Local Municipality Final IDP 2012-2013.

<sup>3</sup> South Africa Rainfall Atlas.

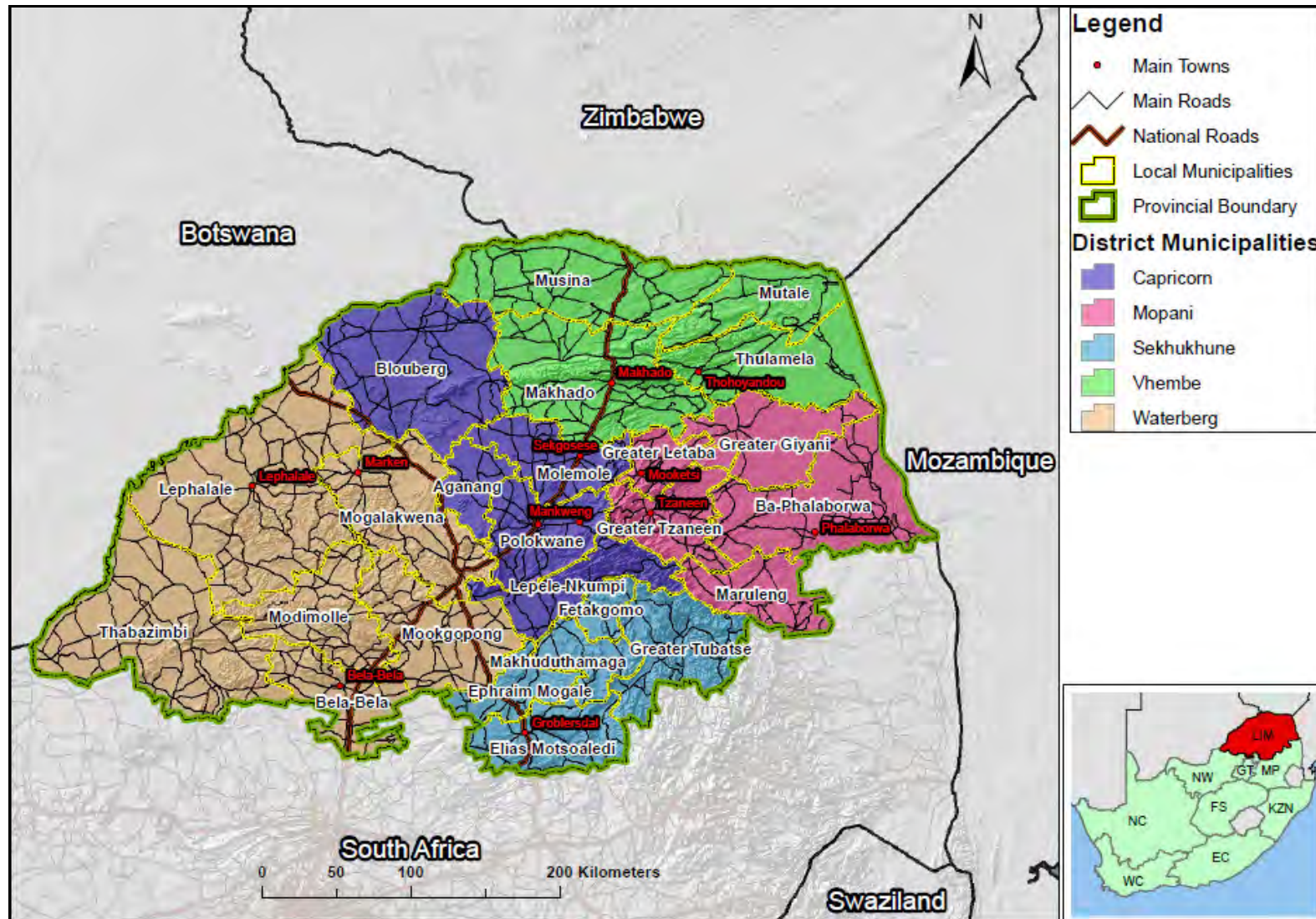
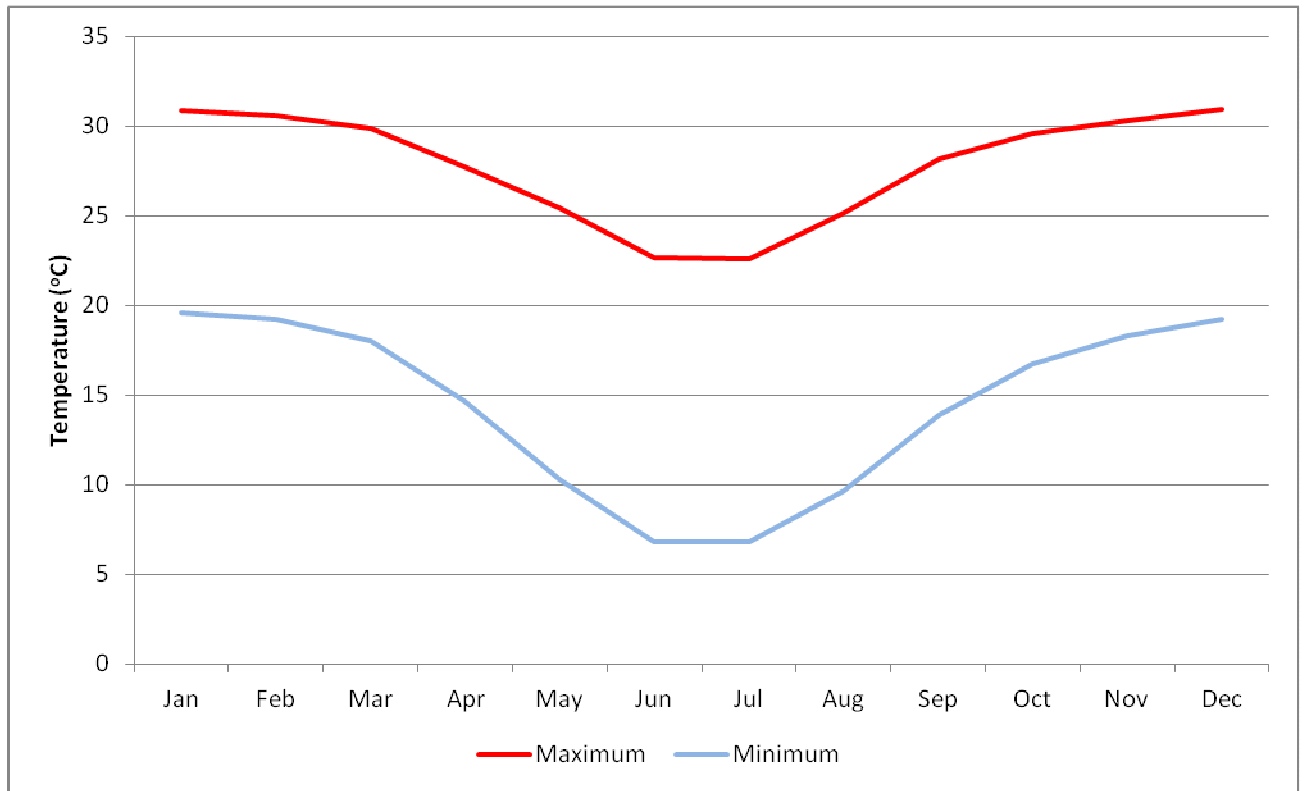


Figure 23: Map of Limpopo Province and its Constituent District and Local Municipalities

- **Temperature**

Summer experiences warm temperatures with daily summer temperatures ranging between 23°C and 32°C. Winter temperatures vary from mild to cool ranging between 7°C and 20°C.



**Figure 24: Average Monthly Minimum and Maximum Temperatures for Lephalale (1979 to 2000)**

- **Wind**

Wind roses comprise 16 spokes which represent the directions from which winds blew during the period. The colours reflect the different categories of wind speeds. The dotted circles provide information regarding the frequency of occurrence of wind speed and direction categories. The resultant vector represents the mean wind direction.

As illustrated in Figure 25 and Figure 26 respectively, it can be seen that Lephalale is not an area of high wind speeds. On average, at the current ash disposal facility, 29.74% of the time, calm conditions existed over the area. The highest frequency of wind speeds lie between 0.5 to 2.1 m/s which occurred for 45.2% of the time. The second highest wind class (2.1 – 3.6 m/s) occurs 17.5% of the time. Figure 25 shows the prevailing winds blowing from a north easterly direction.

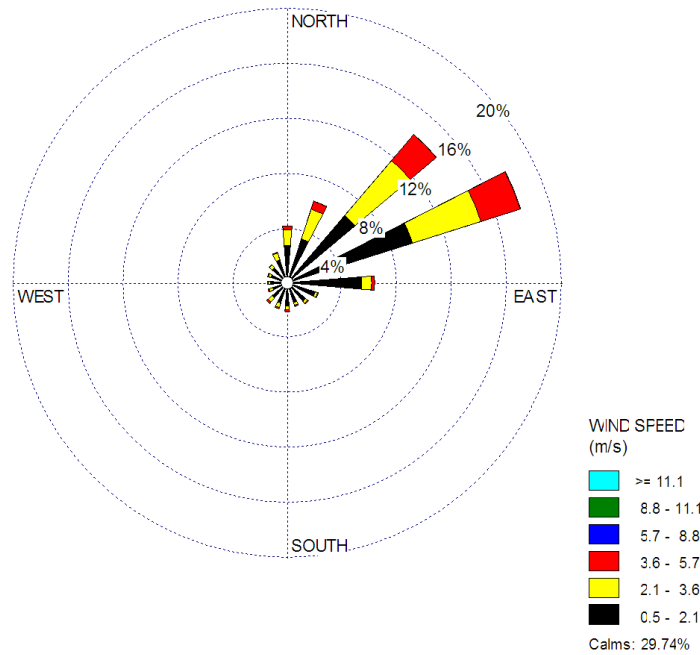


Figure 25: Period Wind Rose for Lephalale for the Period 2007 to 2011

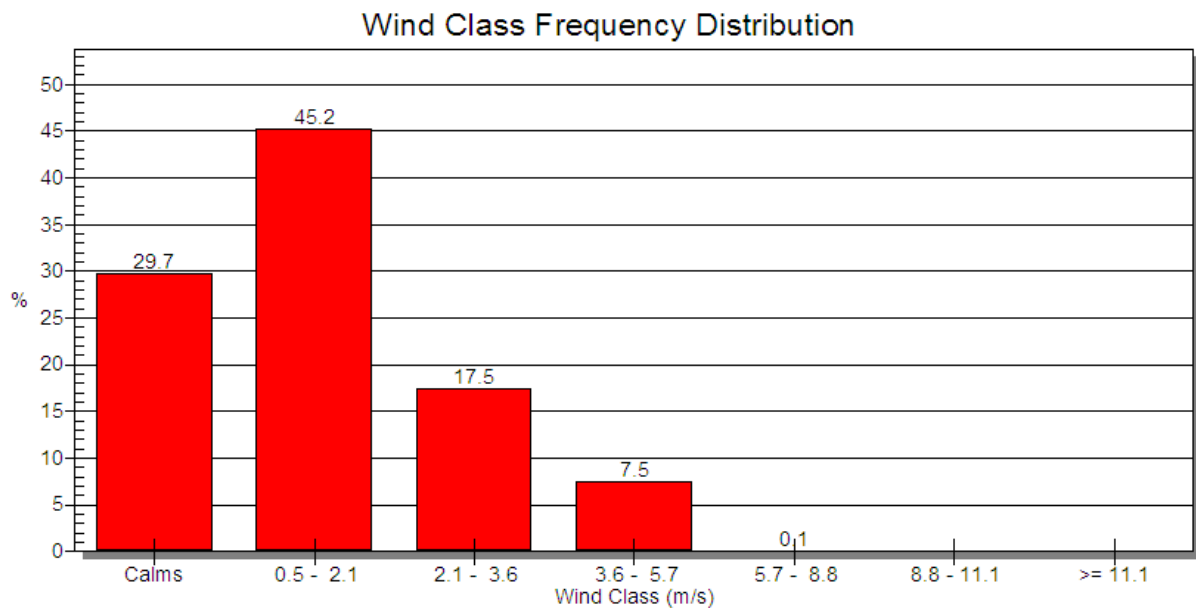


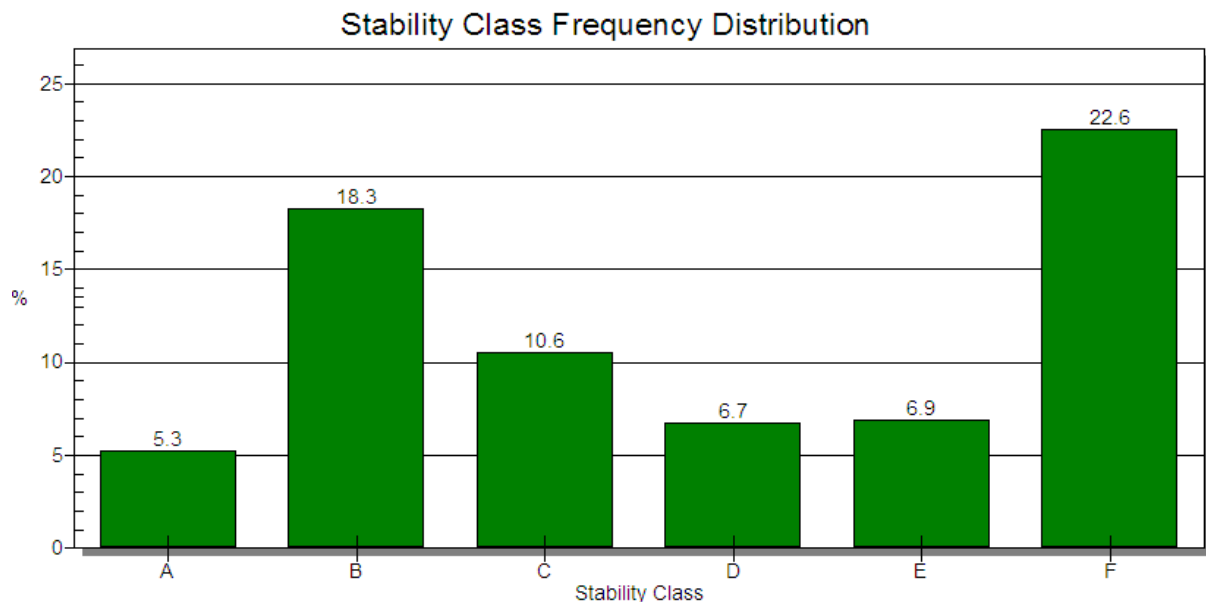
Figure 26: Wind Class Frequency Distribution for Lephalale for the Period 2007 to 2011

- **Atmospheric Stability**

Atmospheric stability is commonly categorised into six stability classes. These are briefly described in Table 13. The atmospheric boundary layer is usually unstable during the day due to turbulence caused by the sun's heating effect on the earth's surface. The depth of this mixing layer depends mainly on the amount of solar radiation, increasing in size gradually from sunrise to reach a maximum at about 5-6 hours after sunrise. The degree of thermal turbulence is increased on clear warm days with light winds. During the night-time a stable layer, with limited vertical mixing, exists. During windy and/or cloudy conditions, the atmosphere is normally neutral. Figure 27 indicates that calm very stable conditions occur 29.1% of the time, which is conducive to the formation of inversion layers and a concentration of pollutants within the valleys surrounding the site.

**Table 13: Atmospheric stability classes**

A	Very unstable	calm wind, clear skies, hot daytime conditions
B	Moderately unstable	clear skies, daytime conditions
C	Unstable	moderate wind, slightly overcast daytime conditions
D	Neutral	high winds or cloudy days and nights
E	Stable	moderate wind, slightly overcast night-time conditions
F	Very stable	low winds, clear skies, cold night-time conditions



**Figure 27: Class Stability Frequency Distribution**

### 6.1.3 Topography

The study area is relatively flat around the Onverwacht / Matimba power station area, and extending north and west. These landscape characteristics mark a change from the area to the south of the town of Lephalale where much more hilly and incised topography, forming part of the Waterberg foothills exists.

In a more localised context, the topography on and around the site of the current ash disposal facility slopes very gently and almost imperceptibly down to the south and the east, towards the very poorly defined valley bottom that is drained by the Sandloop River (a temporary drainage line that runs east-west in close proximity to the south of the existing ash disposal facility). To the south of the river the topography slopes gently up towards the higher-lying ground in the south, where the Waterberg conglomerates<sup>4</sup> outcrop as a series of low rocky outcrops.

### 6.1.4 Geology

Sediments and volcanics of the Waterberg Group and Karoo Supergroup underlie the general study area.

- **Site Geology**

Figure 28 illustrates a portion of the 1:250 000 geological map (2326 Elliras) showing the geological patterns of the study area. The Matimba Ash disposal facility and southern portions of the study area is underlain by the Mogalakwena Formation of the Waterberg Group. This formation is comprised of coarse-grained purplish brown sandstone.

<sup>4</sup> A conglomerate is a type of rough rock constituted of pebbles of different components that are stuck together ([http://www.waterbergbiosphere.org/Sites\\_1030\\_Conglomerate+Geology.html](http://www.waterbergbiosphere.org/Sites_1030_Conglomerate+Geology.html)).

The Eenzaamheid Fault separates the Waterberg Group in the south from the Karoo Supergroup sediments underlying the remainder of the study area to the north. The Swartrant and Grootegeluk Formations of the Karoo Supergroup are located in the central, western and eastern portions. The Swartrant Formation consists of sandstone, gritstone, mudstone and coal and the Grootegeluk Formation consists of mudstone, carbonaceous shale and coal.

The Darby Fault separates the Swartrant Formation from the Clarens Formation to the north of the study area. The Clarens Formation consists of fine-grained cream coloured sandstone. No faults are located within the Waterberg Group sediments within the southern portions of the study area. Several smaller faults are associated with the Swartrant Formation, Grootegeluk Formation and Clarens Formation of the Karoo Supergroup.

- **Structural Geology**

The study area is within the Waterberg Coalfield, which comprises a graben<sup>5</sup> structure with the Eenzaamheid fault forming the southern boundary and the northern boundary is delineated by the Zoetfontein fault. Archaean granite rocks outcrop to the north of the Zoetfontein fault and sediments of the Waterberg Group outcrop to the south of the Eenzaamheid fault.

The geological structures can enhance the groundwater potential in the area by increasing the permeability and transmissivity of the host rock. Secondary processes, such as faulting and fracturing, can create secondary fractured rock aquifers.

- a) The Daarby Fault

The Daarby Fault is a major northeast then northwest trending fault, assumed to be a combination of two faults that have the same throw<sup>6</sup> and throw directions.

The down throw of 360 m to the north serves to bring the Grootegeluk Formation rocks to the south in contact with the younger Clarens Formation sandstone and Letaba Formation basalts in the north. Thus the fault divides the coalfield into a shallow (opencast) coal area to the south of the Daarby Fault, and a deep north coal area. The Daarby thrust fault is impermeable.

- b) The Eenzaamheid Fault

The Eenzaamheid fault has a throw of 250 m to the north and the fault is near vertical. The fault brings the up thrown Waterberg Group sediments on the south side of the fault in contact with shallow coal on the northern side of the fault.

The permeability of the Eenzaamheid fault is not clear, initial groundwater contours indicated that the fault was impermeable and that dewatering at the mine did not impact on the Waterberg Group sediments to the south of the fault.

The Eenzaamheid fault has enhanced groundwater potential and could be targeted for groundwater resource development. The fault can also act as a preferential flow path for groundwater and potential contamination.

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<sup>5</sup> A graben is defined as “a depressed block of land bordered by parallel faults” (Wikipedia, 2013).

<sup>6</sup> A throw is defined as the vertical distance moved when a fault is formed.

([http://www.geologyrocks.co.uk/tutorials/introduction\\_to\\_structural\\_geology](http://www.geologyrocks.co.uk/tutorials/introduction_to_structural_geology)).

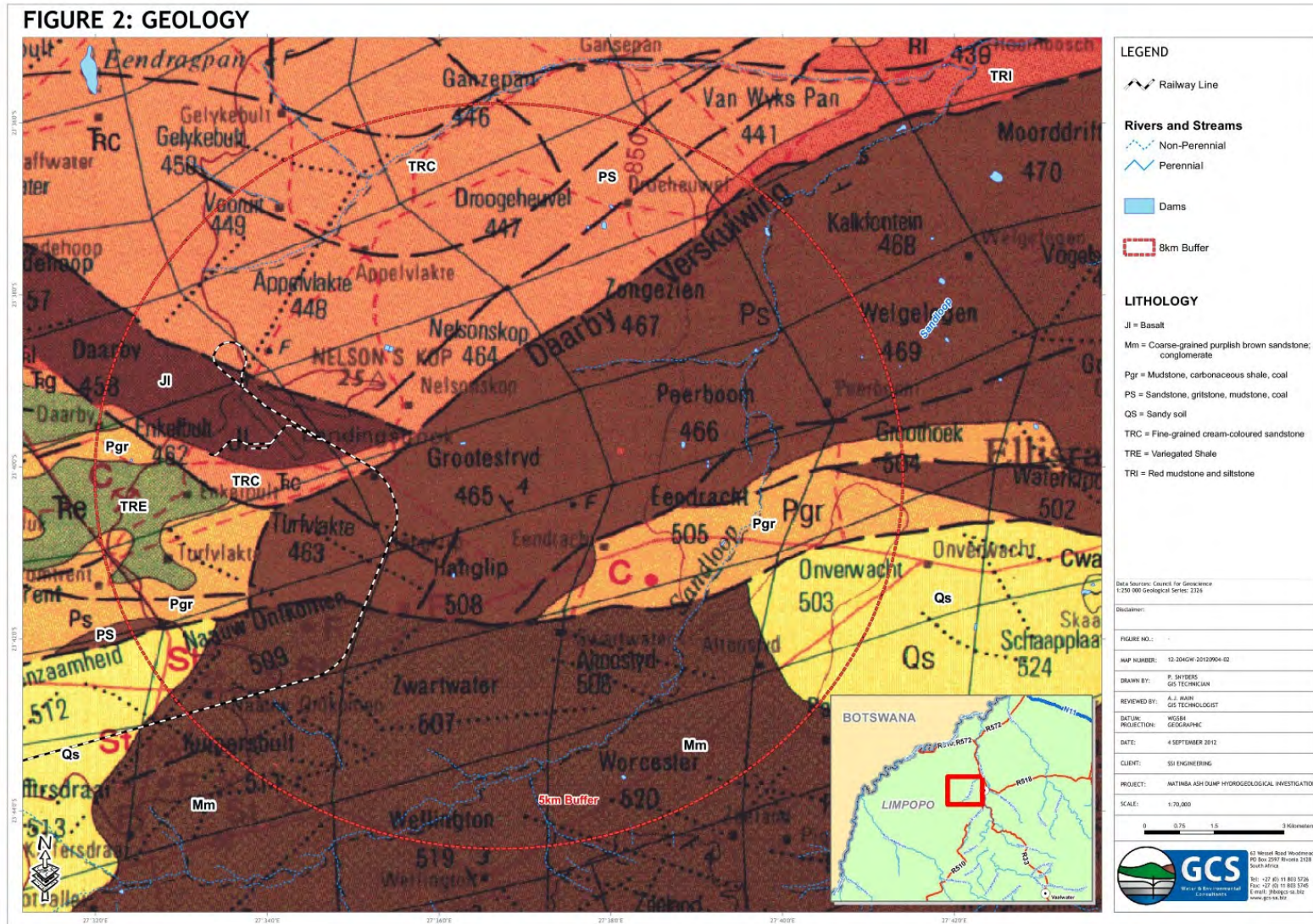


Figure 28: Geological Patterns of the Study Area

c) Minor faulting

Associated step faults are identified within the area, especially where the Eenzaamheid and Daarby faults are in the closest proximity (approximately 2 km). The associated faults have varying strikes, throws, and throw direction. These faults have increased the in situ permeability of these rocks and influence the groundwater flow patterns.

Indications from exploration drilling are that the Daarby and Eenzaamheid faults are linked. This area also acts as a groundwater flow barrier as dewatering occurs within the Grootegeluk and Eendragtpan Formations, but not in the Swartrant Formation, as recognised from the groundwater modelling.

**6.1.5 Geohydrology / Hydrogeology**

• **Regional Geohydrology**

The groundwater potential of the formations located in the study area are limited in their pristine state due to low permeability, storage, and transmissivity. Secondary processes, such as weathering, fracturing, etc., are required to enhance the groundwater potential.

Based on regional data, as compiled on the 1:500 000 hydrogeological map of Polokwane 2326 (2003), the following hydrogeological information is available for the formations on site (Table 14): -

**Table 14: Regional Formations**

Formation	Characteristics
<b>Letaba Formation</b>	<ul style="list-style-type: none"> <li>• Basic extrusive rocks (basalt)</li> <li>• Intergranular and fractured aquifers</li> <li>• Borehole yields 0.1 to 0.5 l/s</li> </ul>
<b>Clarens Formation</b>	<ul style="list-style-type: none"> <li>• Argillaceous and arenaceous rocks</li> <li>• Intergranular and fractured aquifers</li> <li>• Borehole yields 0.1 to 0.5 l/s</li> </ul>
<b>Ecca Group</b>	<ul style="list-style-type: none"> <li>• Upper and middle Ecca (Grootegeluk)</li> <li>• Fractured aquifers</li> <li>• Borehole yields 0.5 to 2.0 l/s</li> </ul>
<b>Ecca Group (Swartrant)</b>	<ul style="list-style-type: none"> <li>• Lower Ecca</li> <li>• Intergranular and fractured aquifers</li> <li>• Borehole yields 0.5 to 2.0 l/s</li> </ul>
<b>Dwyka Group</b>	<ul style="list-style-type: none"> <li>• Predominately arenaceous rocks</li> <li>• Fractured aquifers</li> <li>• Borehole yields 0.5 to 2.0 l/s</li> </ul>
<b>Waterberg Group</b>	<ul style="list-style-type: none"> <li>• Predominantly arenaceous rocks</li> <li>• Fractured aquifers</li> <li>• Borehole yields 0.5 to 2.0 l/s</li> </ul>

• **Regional Groundwater Occurrence and Aquifers**

Based on the structural geology, the geomorphology and the geology within the study area, the following conditions can arise to enhance aquifer development within the study area:

- The fractured transition zone between weathered and fresh bedrock.
- Fractures along contact zones between dykes and the host rocks due to heating and cooling of rocks involved with the intrusions.



- Contact zones between sedimentary rocks of different types.
- Contacts which may be open, enlarged, and loosened by weathering.
- Openings on discontinuities formed by fracturing.
- Faulting due to tectonic forces.
- Stratigraphic unconformities.
- Zones of deeper weathering.
- Fractures related to tensional and decompressional stresses due to off-loading of overlying material.
- Fault zones within the Karoo rocks.

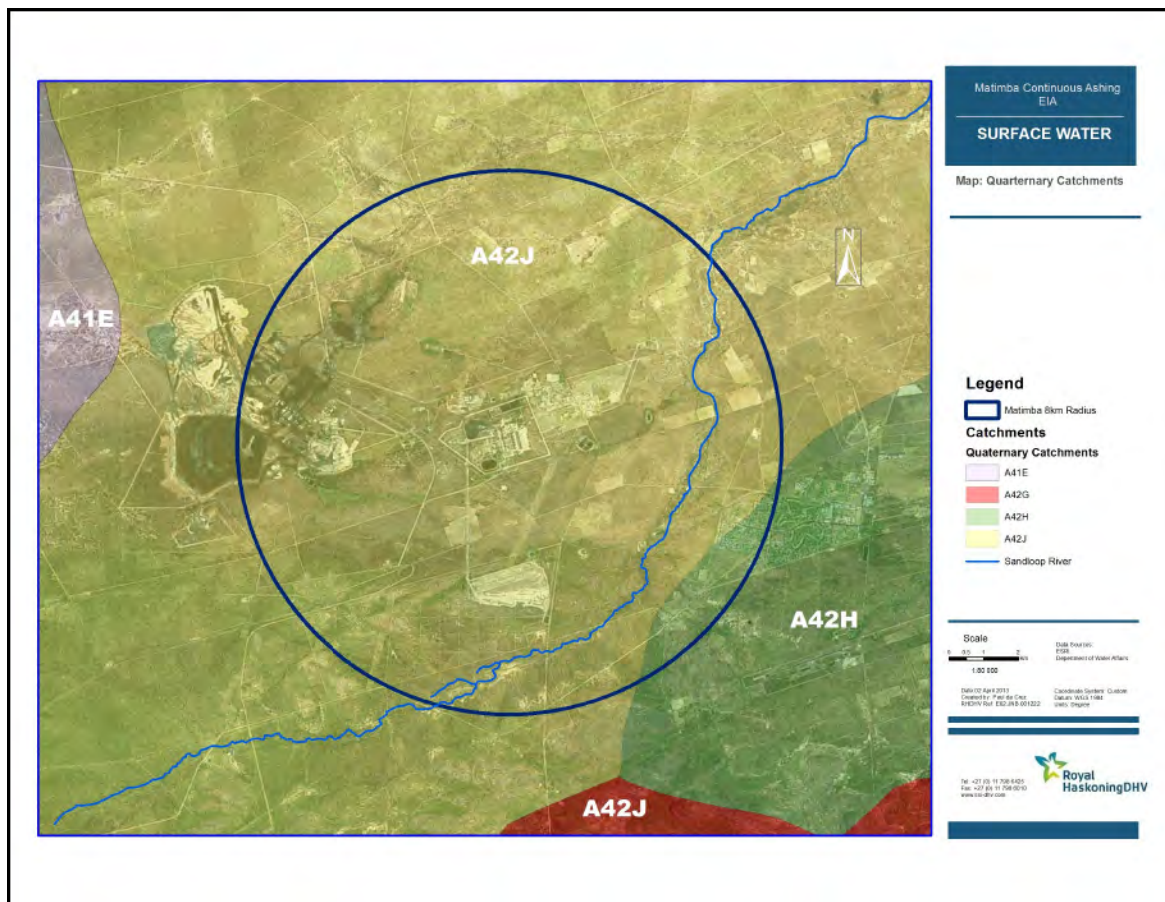
Groundwater occurs within the joints, bedding planes, and along dolerite contacts within the Waterberg Group sediments. Groundwater potential is generally low in these rocks, with 87% of borehole yields < 3 l/s.

- **Quaternary Catchment - Map**

Data from relevant hydrogeological databases including, the National Groundwater Archive (NGA) was obtained from the Department of Water Affairs. The study area falls within two quaternary catchments, namely A42J and A42H as indicated in Table 15.

**Table 15: Summarized Quaternary Catchment Information (GRDM, 2010)**

Quaternary Catchment	Total Area (km <sup>2</sup> )	Recharge mm/a	Current use Mm <sup>3</sup> /a	Exploitation Potential Mm <sup>3</sup> /a	Rainfall mm/a
A42J	1810.8	7.25	0.19	7	428
A42H	1056.6	14.77	0.06	5	518



**Figure 29: Quaternary Catchments in the Study Area**

- **Site Specific Geohydrology**

According to the 1:500 000 hydrogeological map of Polokwane 2326 (2003), the southern portion of study area, south of the Eenzaamheid fault as well as the Grootegeluk Formation is mostly associated with fractured aquifers based on the geology. The average groundwater yields associated with these aquifers, range from 0.5-2 l/s. Numerous faults transect the study area. Lithology north of the Eenzaamheid fault consists of intergranular and fractured aquifers associated with the Swartrant and Clarens Formations with yields ranging from of 0.5-2.0 l/s for the Swartrant Formation and 0.1-0.5l/s for the Clarens Formation.

- **Drainage and Hydrology**

The study area falls within Water Management Area 1: Limpopo and within quaternary catchment area A42J (this is the catchment of the lower-most reaches of the Mokolo River that drains north from the Waterberg Hills into the Limpopo River). The Mean Annual Precipitation (MAP) of A42J is 428 mm and its Mean Annual Runoff (MAR) is 5.81 mm<sup>3</sup>. The area has a Mean Average Evaporation (MAE) of 1949 mm which exceeds its rainfall by almost 5 times. The total surface area size of the A42J catchment is 1027 km<sup>2</sup>.

The 8 km study area seems fairly flat with an average height above sea level of 880 m and therefore, apart from the Sandloop River, drainage is poorly defined and no other rivers exist (with the exception of two small ephemeral drainage lines in the northern part of the radial area which drain into the Sandloop River). The poorly defined drainage in the study area is indicated by the presence of a number of small pans to the east and north of the Matimba Power Station. These indicate that surface runoff in these areas is not connected to the wider drainage network, but is rather inward draining or endoreic. Drainage seems to be in a south easterly direction towards the Sandloop River.

#### **6.1.6 Surface Water**

The study area is in a dry region of the country where surface water flow is not present all year round. The Sandloop River is the major natural surface water resource that was identified in close proximity to the study area. The river is a tributary of the Mokolo River, draining a catchment to the south-west of Lephalale and joining the Mokolo River to the north of the town. The river is non-perennial and is defined by a sandy bed with a distinctive associated riparian zone. The river is thought to be episodic, i.e. only flowing after rainfall events. The Sandloop River drains in an east-west direction in close proximity to the southern portion of the existing ash disposal facility site, and then northwards to the west of Onverwacht.

Overall all rivers in the broader study area (beyond the 8km study area) drain into the Limpopo primary catchment. Within this wider context they form part of the Crocodile River sub-catchment, which drains much of the Highveld and western Bushveld.

#### **6.1.7 Soils and Agricultural Potential**

The proposed study area falls into the **Ae252, Ah85, Ah86, Bc44** and **Bd46** land types (Figure 30).

Map units Aa to Ai refer to yellow and red soils without water tables and belonging in one or more of the following soil form: Inanda, Kranskop, Magwa, Hutton, Griffin and Clovelly. The map units refer to land that does not qualify as a plinthic catena and in which one or more of the above soil forms occupy at least 40% of the area.

The B- group includes a large area of the South African interior that is occupied by a catena, which in its perfect form is represented by (in order from highest to lowest in the upland landscape) Hutton, Bainsvlei, Avalon and Longlands forms. The valley bottoms are occupied by one or other gley soil. Soils with hard plinthite are common over sandstones in the moist climate zones in the eastern part of the country.

A brief description of the land type in terms of soils, land capability, land use and agricultural potential is presented below.

**Table 16: Characteristics of the Land Types**

Land Type	Soils	Land capability and use	Agriculture Potential
<b>Ae252</b>	Predominantly deep red sandy to sandy clay loam soils that are eutrophic or lime containing. Soils in higher lying areas lack signs of clay movement whereas soils in lower lying landscape positions have varied cutanic character indicating signs of incipient soil formation. Shallow and rocky areas occur but are not widespread.	Mainly extensive grazing due to climatic condition constraints. Crop production limited to areas of homogenous deep soils with irrigation. Irrigation land uses are limited due to the lack of large volumes of water.	Low potential due to relatively low and often erratic rainfall (in the region of 400 – 500 mm per year) as well as high evaporative demand. Dryland crop production is not viable in areas with rainfall lower than 500 mm unless significant shallow groundwater is available.
<b>Ah85</b>	Predominantly deep sandy to sandy loam soils that are eutrophic. Soil colours vary from red through yellow-brown to bleached indicating a potential wetness gradient. Soils in higher lying areas lack signs of clay movement whereas soils in lower lying landscape positions often have varied cutanic character indicating signs of incipient soil formation. Shallow and rocky areas occur (not widespread) and are associated with incised drainage channels or stream beds.	Mainly extensive grazing due to climatic condition constraints. Crop production limited to areas of homogenous deep soils with irrigation. Irrigation land uses are limited due to the lack of large volumes of water.	Low potential due to relatively low and often erratic rainfall (in the region of 400 – 500 mm per year) as well as high evaporative demand. Dryland crop production is not viable in areas with rainfall lower than 500 mm unless significant shallow groundwater is available.
<b>Ah86</b>	Predominantly deep sandy to sandy loam soils that are eutrophic. Soil colours vary from red through yellow-brown to bleached indicating a potential wetness gradient. Soils in higher lying areas lack signs of clay movement whereas soils in lower lying landscape positions often have varied cutanic character indicating signs of incipient soil formation. Shallow and rocky areas occur (not widespread) and are associated with incised drainage channels or stream beds.	Mainly extensive grazing due to climatic condition constraints. Crop production limited to areas of homogenous deep soils with irrigation. Irrigation land uses are limited due to the lack of large volumes of water.	Low potential due to relatively low and often erratic rainfall (in the region of 400 – 500 mm per year) as well as high evaporative demand. Dryland crop production is not viable in areas with rainfall lower than 500 mm unless significant shallow groundwater is available.
<b>Bc44</b>	Predominantly deep apedal (structureless), sandy to sandy loam red coloured soils that are eutrophic. Structured soils occur sporadically in lower lying landscape positions. The depression areas are characterised by soils with signs of incipient pedogenesis in the	Predominantly extensive grazing due to climatic constraints in terms of dryland crop production. Due to the level terrain soil erosion is not a major factor.	Low potential due to the relatively low and erratic rainfall (around 500 mm per year). Certain areas can be used for irrigated crop production but then only if adequate water (quantity and quality) is available.

Land Type	Soils	Land capability and use	Agriculture Potential
	form of cutanic character and alluvial stratification.		
<b>Bd46</b>	Predominantly variable depth apedal (structureless), sandy to sandy loam light coloured soils that are eutrophic. Structured soils occur sporadically in lower lying landscape positions. The depression areas are characterised by soils with signs of incipient pedogenesis in the form of cutanic character and alluvial stratification.	Predominantly extensive grazing due to climatic constraints in terms of dryland crop production. Due to the level terrain soil erosion is not a major factor.	Low potential due to the relatively low and erratic rainfall (around 500 mm per year). Certain areas can be use d for irrigated crop production but then only if adequate water (quantity and quality) is available.

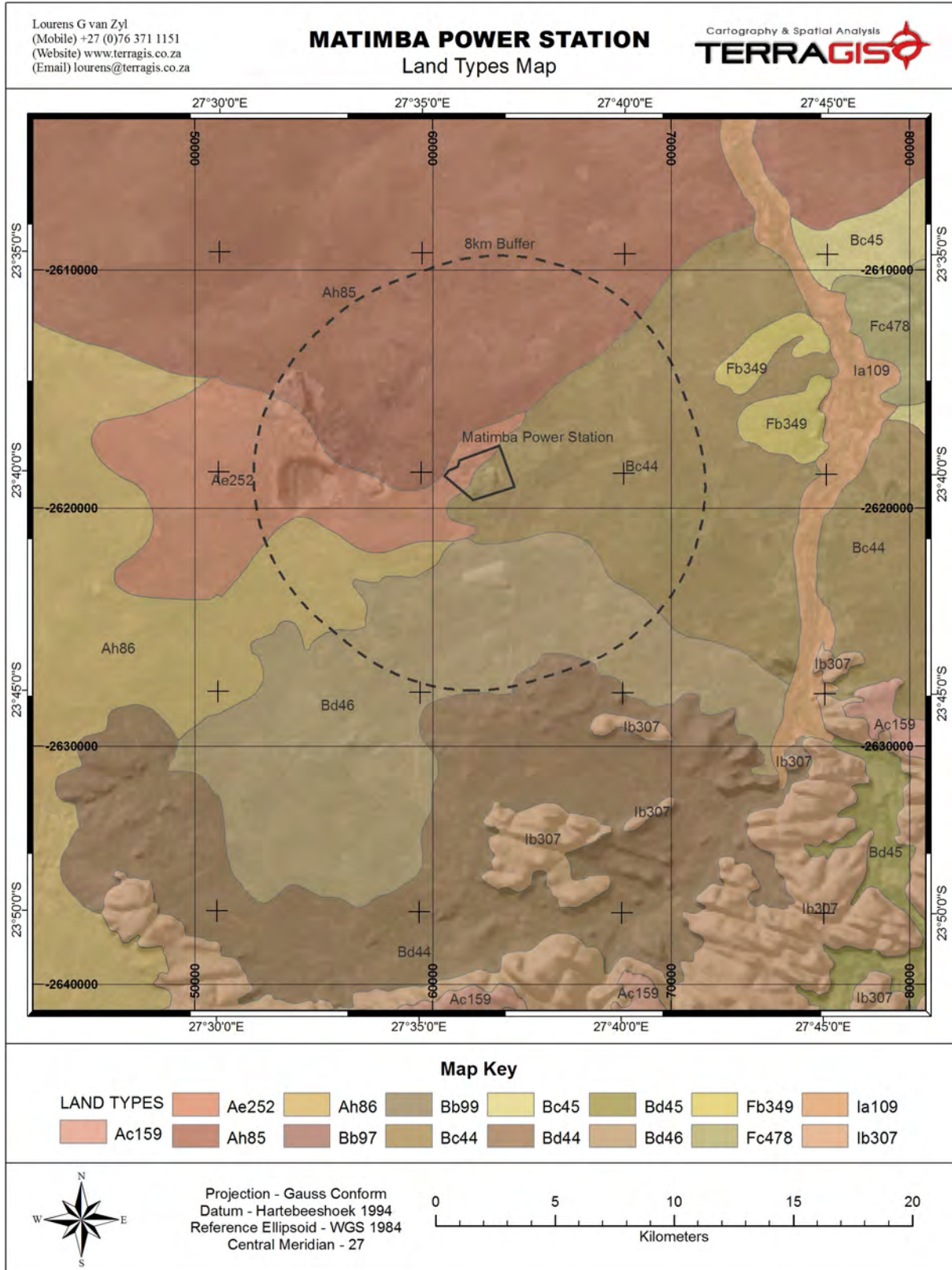


Figure 30: Land Types of the Study Area

### 6.1.8 Regional Vegetation

Vegetation in the region is defined by Mucina and Rutherford (2006) as the Limpopo Sweet Bushveld. This vegetation type extends from the lower reaches of the Crocodile and Marico Rivers down the Limpopo River valley. It is short, open woodland dominated by *Acacia mellifera* and *Dichrostachys cinerea* as well as taller tree species such as *A. robusta*, *A. burkei* and *Terminalia sericea*. The high palatability of the graminoid composition renders this vegetation type highly suitable for game farming practices.

Although this vegetation type is regarded not threatened (Least Threatened), only 1% is formally conserved in statutory conservation areas. Much is however contained within private nature reserves and game farms. Approximately 5% is transformed by cultivation. Though limited by low rainfall, this is a good area for game and cattle farming due to the high grazing capacity of sweet veld. The Central Bushveld endemic herb *Piaranthus atosanguinalis* occurs in this vegetation type. The Least Threatened status afforded to this vegetation belies the fact that high phytodiversity and species richness as well as the presence of several conservation important plant taxa are associated with this region. Recent surveys conducted in the immediate vicinity for the purpose of other EIA applications revealed the presence of several protected tree species.

Information obtained from the South African National Biodiversity Institute (SANBI) database indicates the known presence of approximately 311 plant species within the ¼-degree grid that is spatially represented in the study area. The high floristic diversity of the immediate region reflects the regional diversity context of the savanna biome. An appraisal of the growth forms reflects the diverse woodland physiognomy with 47 dwarf shrubs, 35 shrubs and 11 tree species. A high diversity of herbs (112 species) and grasses (35 species) is represented.

A total of 4 plant taxa of conservation importance that are known to occur in the immediate region including the categories of Threatened, Near Threatened, Rare and Data Deficient. In addition to these species, eight protected trees and geophytes are known to occur within the 8km radius. Furthermore, Manketti individuals (*Schinziophyton rautanenii*) are known to occur in the northern part of the 8km radius. Based on international distribution data, this species is not currently afforded a national or provincial conservation status. However, because of a high scarcity factor within South Africa (confined to only a small area in the Lephalale region), this species is regarded highly important for the purpose of this (and subsequent) investigations. This species is regarded more important than other protected trees that occur widespread in the region and preference ratings for respective sites will take cognisance of the presence/ absence of this species.

Plant taxa of conservation importance that are known to occur in the immediate region include the following:

**Table 17: Plant Species of Conservation Importance within the Broader Region**

Species Name	Family	Status
<i>Acalypha caperonioides</i> var. <i>caperonioides</i>	Euphorbiaceae	Data Deficient
<i>Eulalia aurea</i>	Poaceae	Near Threatened
<i>Euphorbia waterbergensis</i>	Euphorbiaceae	Rare
<i>Corchorus psammophilus</i>	Malvaceae	Threatened

In addition to the species currently captured in the SANBI infobase, the following protected trees and geophytes are known to occur within the 8km radius.

**Table 18: Protected Plant Species within the Broader Region**

Species Name	Family	Status
<i>Acacia erioloba</i>	Fabaceae	Declining, Protected tree
<i>Adansonia digitata</i>	Bombaceae	Protected tree
<i>Ammocharis coranica</i>	Amaryllidaceae	Protected species
<i>Boscia albitrunca</i>	Capparaceae	Protected tree
<i>Combretum imberbe</i>	Combretaceae	Protected tree

Species Name	Family	Status
<i>Securidaca longipedunculata</i>	Polygalaceae	Protected tree
<i>Sclerocarya birrea</i> subsp. <i>africana</i>	Anacardiaceae	Protected tree
<i>Spirostachys africana</i>	Euphorbiaceae	Protected tree

Existing transformation of natural habitat within the 8km radius resulted from mining related infrastructure, new industrial development (Medupi Power Station), the existing ashing facility, and associated linear infrastructure (roads, railways, conveyors, etc.). Natural woodland/ savanna vegetation of the study area and the surrounds is regarded representative of the regional vegetation types, exhibiting limited divergence from the species composition, diversity and vegetation structure described by Mucina and Rutherford (Vegmap, 2006). The status of remaining natural vegetation within the 8km radius is therefore regarded as a primary climax woodland community.

The following macro-habitat types were recognised (see Figure 31):

- Degraded Woodland;
- Floodplain Woodland;
- Old Agricultural Fields;
- Riparian Habitat;
- Terrestrial Woodland;
- Transformed – Industrial/ Urban; and
- Transformed - Linear Infrastructure.

Noteworthy taxa of the Limpopo Sweet Bushveld include the following:

- **Tall Trees**

*Acacia robusta* and *A. burkei*.

- **Small Trees**

*Acacia erubescens*, *A. fleckii*, *A. nilotica*, *A. senegal* var. *rostrata*, *Albizia anthelmintica*, *Boscia albitrunca*, *Combretum apiculatum* and *Terminalia sericea*.

- **Tall Shrubs**

*Catophractes alexandri*, *Dichrostachys cinerea*, *Phaeoptilum spinosum*, *Rhigozum obovatum*, *Cadaba aphylla*, *Combretum hereroense*, *Commiphora pyracanthoides*, *Ehretia rigida* subsp. *rigida*, *Euclea undulata*, *Grewia flava* and *Gymnosporia senegalensis*.

- **Low Shrubs**

*Acacia tenuispina*, *Commiphora africana*, *Felicia muricata*, *Gossypium herbaceum* subsp. *africanum* and *Leucosphaera bainesii*.

- **Graminoids**

*Digitaria eriantha* subsp. *eriantha*, *Enneapogon cenchroides*, *Eragrostis lehmanniana*, *Panicum coloratum*, *Schmidtia pappophoroides*, *Aristida congesta*, *Cymbopogon nardus*, *Eragrostis pallens*, *E. rigidior*, *E. trichophora*, *Ischaemum afrum*, *Panicum maximum*, *Setaria verticillata*, *Stipagrostis uniplumis* and *Urochloa mosambicensis*.

- **Herbs**

*Acanthosicyos naudinianus*, *Commelina benghalensis*, *Harpagophytum procumbens* subsp. *transvaalense*, *Hemizygia elliotii*, *Hermibstaedtia odorata*, *Indigofera daleoides*, *Kleinia fulgens* and *Plectranthus neochilus*.

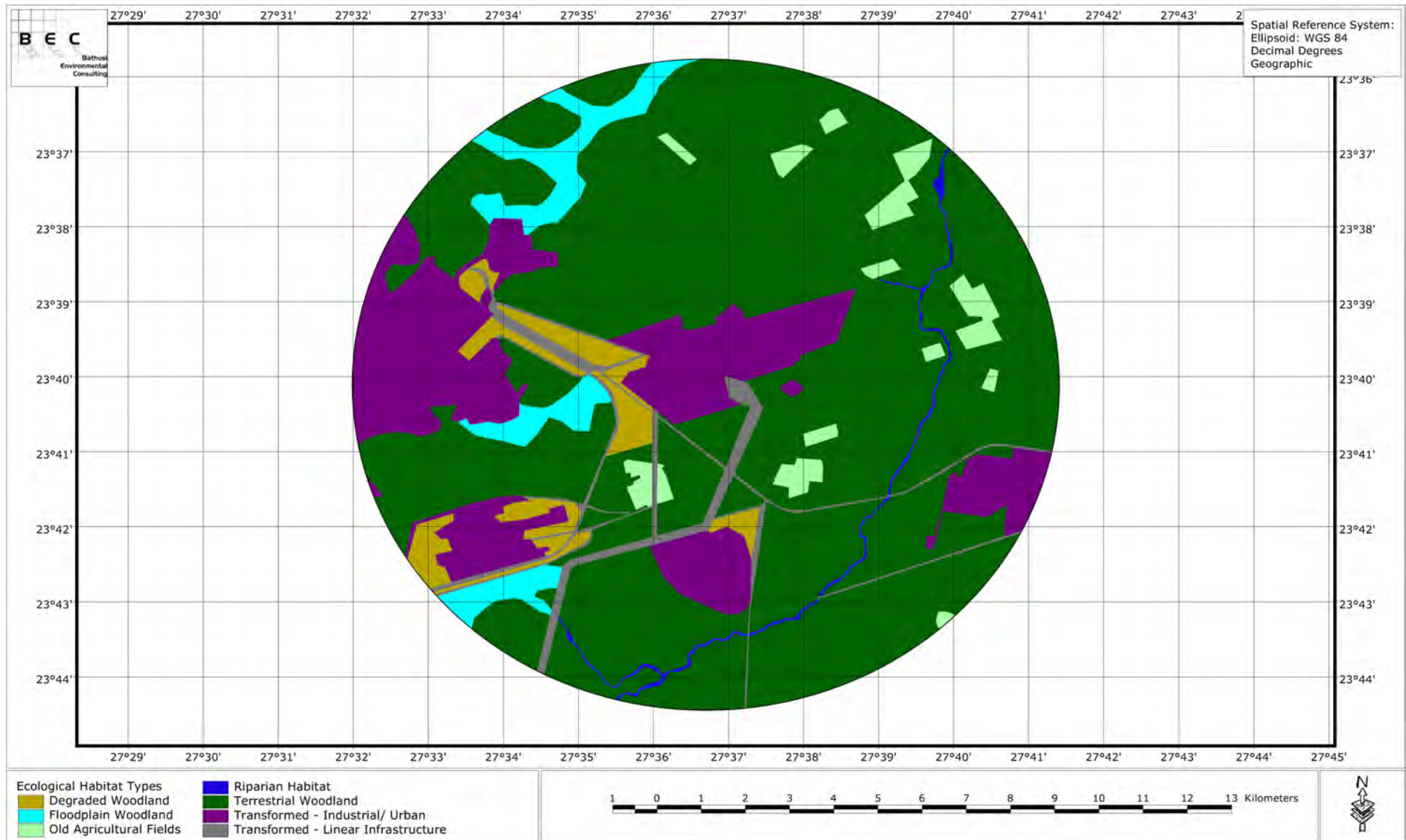


Figure 31: Macro Habitat Types of the Region



### 6.1.9 Regional Faunal Diversity

For the Red Data fauna assessment, species are classified under the following categories:

- A species is **Data Deficient** when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- A taxon is **Near Threatened** when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
- A species is **Rare** when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria.
- A species is **Threatened** when it is included in one of the Critically Endangered (Possibly Extinct), Critically Endangered, Endangered or Vulnerable categories.

A total of at least 14 Red Data species are known to be present in the general region of the study area as indicated in Table 19.

**Table 19: Red Data Probabilities for the Study Area**

Species Details			Probability of
Biological Name	English Name	Red D Status	Occurrence
<b>Butterflies</b>			
<i>Alaena margaritacea</i>	Wolkberg Zulu	Critically Rare	low
<i>Aloeides stevensoni</i>	Stevenson's Copper	Vulnerable	low
<i>Charaxes guderiana guderiana</i>	Blue-spangled Charaxes	Vulnerable	low
<i>Dingana clara</i>	Clara's Widow	Vulnerable	low
<i>Erikssonia edgei</i>	Eriksson's Copper	Critically Rare	low
<i>Lepidochrysops lotana</i>	Lotana Blue	Critically Rare	low
<i>Metisella meninx</i>	Marsh Sylph	Vulnerable	low
<i>Pseudonympha swanepoeli</i>	Swanepoel's Brown	Critically Rare	low
<b>Frogs</b>			
<i>Breviceps sylvestris</i>	Northern Forest Rain Frog	Vulnerable	low
<b><i>Pyxicephalus adspersus</i></b>	<b>Giant Bullfrog</b>	<b>Near Threatened</b>	<b>confirmed/ high</b>
<b>Reptiles</b>			
<i>Acontias kgalagadi subtaeniatus</i>	Stripe-bellied Blind Legless Skink	Data Deficient	moderate-low
<i>Acontias richardi</i>	Richard's Blind Legless Skink	Near Threatened	low
<i>Acontias rieppeli</i>	Woodbush Legless Skink	Endangered	low
<i>Afroedura multiporis multiporis</i>	Woodbush Flat Gecko	Vulnerable	low
<i>Australolacerta rupicola</i>	Soutpansberg Rock Lizard	Near Threatened	low
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	Near Threatened	low
<i>Chamaesaura macrolepis</i>	Large-scaled Grass Lizard	Near Threatened	low
<i>Chirindia langi occidentalis</i>	Soutpansberg Worm Lizard	Vulnerable	low
<i>Crocodylus niloticus</i>	Nile Crocodile	Vulnerable	moderate-low
<i>Homopholis mulleri</i>	Muller's Velvet Gecko	Vulnerable	low
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	Near Threatened	low
<i>Kininyx natalensis</i>	Natal Hinged Tortoise	Near Threatened	low
<i>Lamprophis fuscus</i>	Yellow-bellied House Snake	Near	low

Species Details			Probability of
Biological Name	English Name	Red D Status	Occurrence
		Threatened	
<i>Lygodactylus graniticolus</i>	Granite Dwarf Gecko	Near Threatened	low
<i>Lygodactylus methueni</i>	Methuen's Dwarf Gecko	Vulnerable	low
<i>Lygodactylus nigropunctatus incognitus</i>	Cryptic Dwarf Gecko	Data Deficient	low
<i>Lygodactylus nigropunctatus montiscaeruli</i>	Makgabeng Dwarf Gecko	Data Deficient	low
<i>Lygodactylus ocellatus soutpansbergensis</i>	Soutpansberg Dwarf Gecko	Near Threatened	low
<i>Platysaurus monotropis</i>	Orange-throated Flat Lizard	Endangered	low
<i>Platysaurus relictus</i>	Soutpansberg Flat Lizard	Near Threatened	low
<i>Pseudocordylus transvaalensis</i>	Northern Crag Lizard	Near Threatened	low
<i>Scelotes limpopoensis albiventris</i>	White-bellied Dwarf Burrowing Skink	Near Threatened	low
<i>Tetradactylus breyeri</i>	Breyer's Long-tailed Seps	Vulnerable	low
<i>Tetradactylus eastwoodae</i>	Eastwood's Long-tailed Seps	Extinct	low
<i>Xenocalamus transvaalensis</i>	Speckled Quill-snouted Snake	Data Deficient	low
<b>Birds</b>			
<i>Phoenicopterus roseus</i>	Greater Flamingo	Near Threatened	low
<i>Phoenicopterus minor</i>	Lesser Flamingo	Near Threatened	low
<i>Mycteria ibis</i>	Yellow-billed Stork	Near Threatened	moderate
<i>Ciconia nigra</i>	Black Stork	Near Threatened	moderate-low
<i>Ephippiorhynchus senegalensis</i>	Saddle-billed Stork	Endangered	low
<i>Leptoptilos crumeniferus</i>	Marabou Stork	Near Threatened	moderate-low
<i>Gorsachius leuconotus</i>	White-backed Night Heron	Vulnerable	low
<i>Pelecanus rufescens</i>	Pink-backed Pelican	Vulnerable	low
<i>Sagittarius serpentarius</i>	Secretarybird	Near Threatened	high
<b><i>Gyps africanus</i></b>	<b>White-backed Vulture</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable	moderate
<b><i>Trigonoceps occipitalis</i></b>	<b>White-headed Vulture</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<b><i>Torgos tracheliotus</i></b>	<b>Lappet-faced Vulture</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<b><i>Terathopius ecaudatus</i></b>	<b>Bateleur</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Circus macrourus</i>	Pallid Harrier	Near Threatened	moderate-low
<i>Aquila rapax</i>	Tawny Eagle	Vulnerable	high
<i>Hieraaetus ayresii</i>	Ayres's Hawk-Eagle	Near Threatened	low
<b><i>Polemaetus bellicosus</i></b>	<b>Martial Eagle</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Falco naumanni</i>	Lesser Kestrel	Vulnerable	moderate
<i>Falco biarmicus</i>	Lanner Falcon	Near Threatened	high
<b><i>Ardeotis kori</i></b>	<b>Kori Bustard</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Podica senegalensis</i>	African Finfoot	Vulnerable	low

Species Details			Probability of
Biological Name	English Name	Red D Status	Occurrence
<i>Vanellus albiceps</i>	White-crowned Lapwing	Near Threatened	moderate-low
<i>Rostratula benghalensis</i>	Greater Painted-snipe	Near Threatened	moderate-low
<i>Glareola nordmanni</i>	Black-winged Pratincole	Near Threatened	moderate
<i>Alcedo semitorquata</i>	Half-collared Kingfisher	Near Threatened	low
<i>Bucorvus leadbeateri</i>	Southern Ground-Hornbill	Vulnerable	moderate
<i>Buphagus erythrorhynchus</i>	Red-billed Oxpecker	Near Threatened	high
<b>Mammals</b>			
<i>Amblysomus hottentotus</i>	Hottentot's Golden Mole	Data Deficient	low
<i>Calcochloris obtusirostris</i>	Yellow Golden Mole	Vulnerable	low
<i>Neamblysomus gunningi</i>	Gunning's Golden Mole	Endangered	low
<i>Neamblysomus juliane</i>	Juliana's Golden Mole	Vulnerable	low
<i>Atelerix frontalis</i>	South African Hedgehog	Near Threatened	moderate
<i>Elephantulus brachyrhynchus</i>	Short-snouted Elephant-shrew	Data Deficient	moderate
<i>Elephantulus intufi</i>	Bushveld Elephant-shrew	Data Deficient	moderate-high
<i>Petrodromus tetradactylus</i>	Four-toed Elephant-shrew	Endangered	low
<i>Myosorex cafer</i>	Dark-footed Forest Shrew	Data Deficient	low
<i>Myosorex varius</i>	Forest Shrew	Data Deficient	low
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	Data Deficient	moderate-high
<i>Crocidura fuscomurina</i>	Tiny Musk Shrew	Data Deficient	low
<i>Crocidura hirta</i>	Lesser Red Musk Shrew	Data Deficient	moderate
<i>Crocidura maquassiensis</i>	Maquassie Musk Shrew	Vulnerable	low
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	Data Deficient	low
<i>Crocidura silacea</i>	Lesser Grey-brown Musk Shrew	Data Deficient	low
<i>Suncus infinitesimus</i>	Least Dwarf Shrew	Data Deficient	low
<i>Suncus lixus</i>	Greater Dwarf Shrew	Data Deficient	low
<i>Suncus varilla</i>	Lesser Dwarf Shrew	Data Deficient	low
<i>Cloeotis percivali</i>	Percival's Short-eared Trident Bat	Vulnerable	moderate
<i>Hipposideros gigas</i>	Giant Leaf-nosed Bat	Near Threatened	moderate-low
<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat	Near Threatened	moderate
<i>Rhinolophus swinnyi</i>	Swinny's Horseshoe Bat	Near Threatened	low
<i>Nycteris woodi</i>	Wood's Slit-faced Bat	Near Threatened	low
<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	Near Threatened	moderate-high
<i>Neoromicia melckorum</i>	Kruger Serotine	Data Deficient	low
<i>Cercopithecus mitis</i>	Samango Monkey	Vulnerable	low
<i>Cercopithecus mitis erythrarchus</i>	Samango Monkey	Vulnerable	low
<i>Cercopithecus mitis labiatus</i>	Samango Monkey	Endangered	low
<b><i>Manis temminckii</i></b>	<b>Pangolin</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Graphiurus platyops</i>	Rock Dormouse	Data Deficient	low
<i>Cricetomys gambianus</i>	Giant Rat	Vulnerable	low

Species Details			Probability of
Biological Name	English Name	Red D Status	Occurrence
<i>Dendromus nyikae</i>	Nyika Climbing Mouse	Near Threatened	low
<i>Tatera leucogaster</i>	Bushveld Gerbil	Data Deficient	high
<i>Lemniscomys rosalia</i>	Single-striped Mouse	Data Deficient	moderate-high
<i>Dasymys incomtus</i>	Water Rat	Near Threatened	low
<i>Mus neavei</i>	Thomas' Pygmy Mouse	Data Deficient	low
<i>Grammomys cometes</i>	Mozambique Woodland Mouse	Data Deficient	low
<i>Grammomys dolichurus</i>	Woodland Mouse	Data Deficient	low
<b><i>Panthera pardus</i></b>	<b>Leopard</b>	<b>Near Threatened</b>	<b>confirmed/ high</b>
<i>Panthera leo</i>	Lion	Vulnerable	low
<i>Leptailurus serval</i>	Serval	Near Threatened	moderate
<b><i>Acinonyx jubatus</i></b>	<b>Cheetah</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<i>Felis nigripes</i>	Black-footed Cat	Vulnerable	low
<i>Crocuta crocuta</i>	Spotted Hyaena	Near Threatened	low
<b><i>Parahyaena brunnea</i></b>	<b>Brown Hyaena</b>	<b>Near Threatened</b>	<b>confirmed/ high</b>
<i>Paracynictis selousi</i>	Selous' Mongoose	Data Deficient	low
<i>Rhynchogale melleri</i>	Meller's Mongoose	Data Deficient	low
<i>Canis adustus</i>	Side-striped Jackal	Near Threatened	low
<i>Lycaon pictus</i>	African Wild Dog	Endangered	low
<b><i>Mellivora capensis</i></b>	<b>Honey Badger</b>	<b>Near Threatened</b>	<b>confirmed/ high</b>
<i>Poecilogale albinucha</i>	African Striped Weasel	Data Deficient	moderate
<i>Lutra maculicollis</i>	Spotted-necked Otter	Near Threatened	low
<i>Loxodonta africana</i>	African Savanna Elephant	Vulnerable	low
<i>Diceros bicornis</i>	Black Rhinoceros	Critically Rare	low
<i>Ceratotherium simum</i>	White Rhinoceros	Near Threatened	low
<i>Hippopotamus amphibius</i>	Common Hippopotamus	Vulnerable	low
<i>Neotragus livingstonianus</i>	Livingstone's Suni	Vulnerable	low
<i>Raphicerus sharpei</i>	Sharp's Grysbok	Near Threatened	low
<i>Hippotragus equinus</i>	Roan Antelope	Vulnerable	low
<b><i>Hippotragus niger</i></b>	<b>Southern Sable Antelope</b>	<b>Vulnerable</b>	<b>confirmed/ high</b>
<b><i>Damaliscus lunatus</i></b>	<b>Western Tsessebe</b>	<b>Endangered</b>	<b>confirmed/ high</b>

## 6.2 The Social Environment

### 6.2.1 Social

The study area falls in the Waterberg District Municipality (DC 36), and within the jurisdiction of the Lephalale Local Municipality (LIM 362) of the Limpopo Province. According to Census 2011, the population of the Lephalale Local Municipality was approximately 115765 persons with 54% consisting of males and 46% females.

The settlements found within the local municipality include the Lephalale town, informal settlements, farms, villages and townships. Onverwacht, Ellisras and Marapong make up Lephalale town's nodes. The local municipality is serviced by the regional R578 and the national N11 roads. Notable industrial establishments within the study area include the Matimba Power Station, Exxaro Grootegeluk mine and the Medupi Power Station (currently under construction).

The significant economic activity of the Lephalale Local Municipality is mining which contributes 59.21% to the National Gross Domestic Product.

Social challenges facing the local municipality include high HIV/AIDS incidences, high unemployment rates and high illiteracy levels<sup>7</sup>.

### 6.2.2 Air Quality

#### • Identified Sensitive Receptors

A sensitive receptor for the purposes of the current investigation can be defined as a person or place where involuntary exposure to pollutants released by the proposed ash disposal facility, can be expected to take place. For the purposes of this study, areas of development such as residential, industries educational and recreational areas are identified as sensitive receptors. The receptors identified during the current study include:

- Lephalale Town (including Marapong and Onverwacht townships)
- Ubuntu Occupational Health Services;
- Several guest houses;
- Doctors practices; and
- Local airstrip
- Matimba Power Station
- Medupi Power Station
- Farm houses
- Game reserve

#### • Sources of Air Pollution

Based on an aerial photo and site description of the area, the following sources of potential air pollution have been identified:

- Matimba Power Station
- Matimba ash disposal facility
- Medupi Power Station (currently under construction)
- Veld fires
- Domestic fuel burning at the surrounding township
- Vehicle entrainment
- Agriculture
- Mining Operations (Grootegeluk Colliery)

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<sup>7</sup> Lephalale Local Municipality-Integrated Development Plan 2012-2013.

### **6.2.3 Visual**

Visual character can be defined based on the level of change or transformation from a completely natural setting which would represent a natural baseline in which there is little evidence of human transformation of the landscape. Varying degrees of human transformation of a landscape would engender differing visual characteristics to that landscape, with a highly modified urban or industrial landscape being at the opposite end of the scale to a largely natural undisturbed landscape.

The town of Lephalale is increasingly taking on the character of an industrial hub with the presence of two massive power station complexes. The current impression of a town rapidly morphing from a rural farming service centre to an industrial centre, is also given by the amount of construction currently occurring in and around the town, including road construction, residential development and instalment of bulk services such as pipelines. The character of the study area is thus arguably predominantly industrial in character. However due to the proximity of rural farming areas to the existing ash disposal facility in particular, and due to the presence of remnant areas of natural woodland vegetation, e.g. in between Matimba Power Station and Onverwacht, the area has retained a partly natural character. The presence of woodland vegetation that is highly effective in screening views from the viewer's location within that vegetation type also tends to contribute to the perception of a more natural setting. In this way a person can be located relatively close to the Matimba Power Station complex and not be able to view it, with only the drone of the power station or a glimpse of the highest points of the stacks giving away the presence of the power station.

### **6.2.4 Heritage**

- **Stone Age**

A site containing engravings was identified on the farm Nelsons Kop 464 LQ. This site is of high significance on a provincial basis and should be avoided at all costs.

- **Iron Age**

No sites, features or objects dating to the Iron Age were identified in the study area.

- **Historic period**

The farm Zwartwater 507 LQ was used for farming and game ranching activities even after a section was used for the development of an ash disposal facility for Matimba Power Station. Consequently, a large range of related features are found in the study area which range from stock pens to water points and game viewing hides and all which are of recent origin. For example, the date of June 1970 has been imprinted on all of the small dams.

A small cemetery also occurs on the farm Zwartwater 507 LQ and it is located on the eastern side of the current ash disposal facility. This site is known to the relevant authorities and has been fenced off and is well protected.

Headgear for the original mine exploration done in the region during the 1960s, was found on farm Eendracht 505LQ. It is viewed to have a high significance on a provincial level.

An old farm house is also located to the east of the existing ash disposal facility and is currently being used by Roshcon as site office.

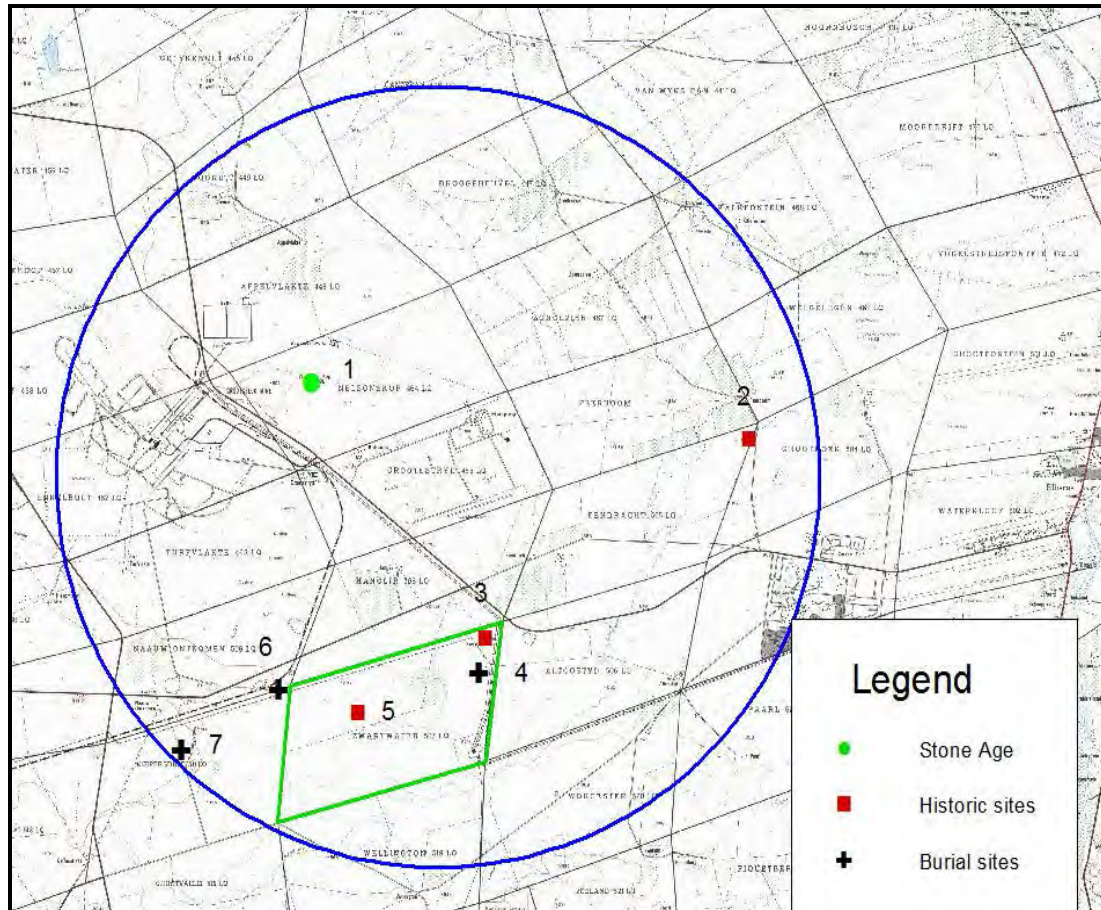


Figure 32: Heritage Sites within the Study Area

### 6.2.5 Land Use

The main existing land uses in the study area are:

- **Residential**
  - ✓ Town of Lephalale (Ellisras). The nearest section of the town to the study area namely Onverwacht Township lies approximately 4.5 km to the east of the existing ash disposal facility.
  - ✓ Marapong Township lies 650 m to the north-east of Matimba Power Station.
  - ✓ There are numerous farmhouses and farm labourer houses spread throughout the study area.
- **Educational**
  - ✓ There are several farm schools spread out through the study area.
  - ✓ There are schools in Lephalale
- **Industrial**
  - ✓ Matimba Power Station.
  - ✓ Medupi Power station (under construction).
  - ✓ Airstrip
  - ✓ There is a small industrial area just to the north of Onverwacht.
- **Mining**
  - ✓ The Grootegeluk Coal Mine, which provides Matimba Power Station and will provide the Medupi Power Station with coal, is located just to the west of Matimba Power Station.

- **Agriculture**

- ✓ The main land use in the study area and its environs is cattle and game farming.

- **Tourism**

- ✓ There is a game reserve (Manketti Reserve) to in the northern part of the study area.

### **6.2.6 Noise**

The main sources of noise in the area are from traffic on the main roads, Matimba Power Station, power station infrastructure remote from the facility, Medupi Power Station (still under construction) and the Grootegeluk Coal Mine. These noise sources are significant contributors to a degraded noise climate.

### **6.2.7 Traffic**

- **Roads**

There are a number of roads servicing the study area. These include:

- i) Road D1675 is a surfaced road aligned in an east-west direction and linking Lephalale to Steenbokpan. It links from Road P84/1 (Route R510) in Lephalale to Road P16/2. The section of the road east of the intersection with Road D2001, namely the section through Onverwacht and Lephalale, is named Nelson Mandela Drive.
- ii) Road D2001 is the main access to Matimba Power Station from Road D1675 (Nelson Mandela Drive). It is surfaced road on the section from its intersection with Road D1675 to Matimba Power Station and Grootegeluk Coal Mine. North of the coal mine it is a gravel road up to its intersection with Road P84/1 near the Stockpoort border post.
- iii) Road D175 is a gravel road aligned in a north-south direction linking from the Stockpoort border post on the Limpopo River to Road P84/1 (Route 510). This road is aligned through Steenbokpan.
- iv) Road D2286 is a gravel road linking from Road P16/2 in the west through to Road D175 north of Steenbokpan and that is aligned close to and follows the course of the Limpopo River.
- v) Road D1925 is a gravel road that is aligned in a north-south direction through the eastern portion of the study area. It links to Road D2649 just south of Medupi Power Station.
- vi) Road D2649 is a gravel road that links from D1675 just east of Medupi Power Station to Road P84/1 (Route R510) approximately 20km south of Lephalale.
- vii) Road D2701 is a gravel road aligned in an east-west direction that links from Road P16/2 to Road D1925.

- **Rail**

The only railway line in the area is aligned through the south-eastern sector of the study area, linking from the Grootegeluk Coal Mine southwards to Thabazimbi. Its main use is the transport of coal from the Coal Mine. There are at present usually two trains per day.



## 7 POTENTIAL ENVIRONMENTAL IMPACTS

### 7.1 Geohydrology / Hydrogeology

Borehole information derived from the Department of Water Affairs (DWA), National Groundwater Archive (NGA) and the monitoring data from the power station and Grootegeluk coal mine allowed for an assessment of the hydrogeology, aquifers, and water levels in the area.

#### **7.1.1 Groundwater Levels**

Data was collected from the NGA boreholes, from the DWA, the GRIP (Groundwater Resource Information Project) database, as well as data supplied from the monitoring boreholes present at Matimba Power Station and the Grootegeluk Mine compiled for previous GCS studies. The localities of these boreholes have been plotted on Figure 33.

The data for the NGA and GRIP boreholes was compiled for quaternary catchments A42J and A42H.

Table 20 lists the details of the NGA boreholes plotted on Figure 33 located within the 8km study area. Water level and water use data were not available for all boreholes in the database. The water levels ranged from 1.83 to 60.96 meters below ground level (mbgl), which were measured between 1953 and 1972.

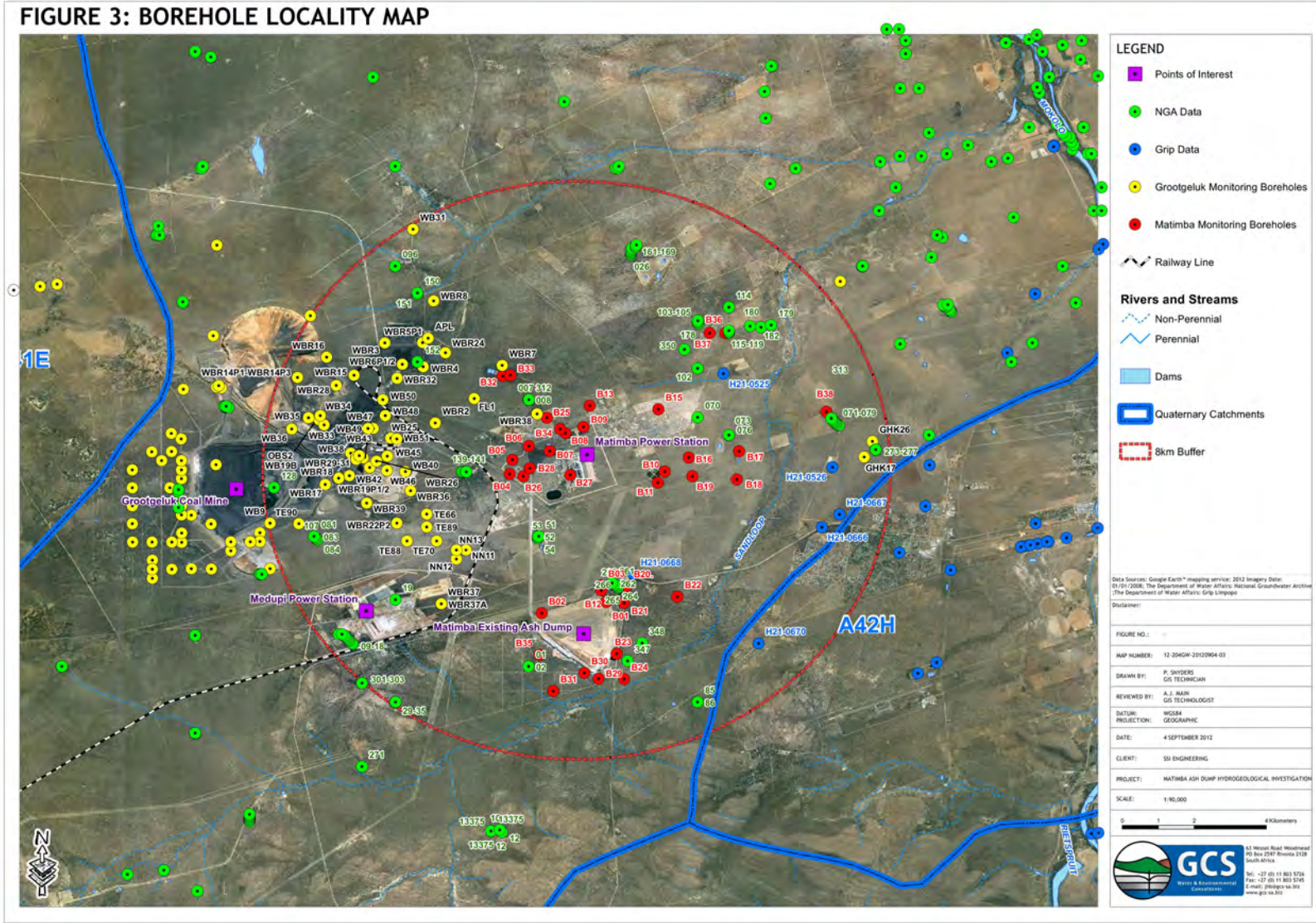


Figure 33: Borehole Locality Map

**Table 20: NGA Borehole Data within the Study Area**

Geosite Info Identifier	Latitude	Longitude	Water Level Measurement Date	Water Level (mbgl)	Water Use
1	-23.7174	27.5997	-	-	-
2	-23.7174	27.5997	-	-	-
7	-23.6507	27.5997	-	-	-
8	-23.6508	27.5997	1958/04/23	27.43	-
9	-23.7116	27.55553	-	-	-
10	-23.7119	27.55581	-	-	-
11	-23.7094	27.55303	1958/02/11	30.48	-
13	-23.7096	27.55359	1958/01/04	9.14	-
14	-23.7099	27.55387	1958/08/04	10.36	-
15	-23.7102	27.55414	1958/07/18	21.34	-
16	-23.7105	27.55442	1958/06/04	45.72	-
17	-23.7107	27.5547	1958/01/25	60.96	-
18	-23.711	27.55498	-	-	-
19	-23.7007	27.56642	1958/04/30	13.72	-
26	-23.6144	27.62526	1960/08/25	21.34	-
29	-23.7263	27.56637	1960/02/10	22.86	-
30	-23.7263	27.56637	1959/12/14	22.86	-
31	-23.7263	27.56638	1961/06/09	48.77	-
33	-23.7263	27.56639	1960/10/31	18.29	-
35	-23.7263	27.5664	1959/11/24	22.86	-
51	-23.6849	27.6022	-	-	-
52	-23.6849	27.60192	-	-	-
53	-23.6852	27.60192	1953/06/05	60.96	-
54	-23.6855	27.60192	1953/06/30	24.38	-
70	-23.6552	27.64192	-	-	-
71	-23.6555	27.67526	1957/01/12	33.53	-
72	-23.6557	27.67553	1957/01/04	27.43	-
73	-23.6596	27.64972	-	-	-
74	-23.656	27.67581	1951/10/30	30.48	-
75	-23.6563	27.67609	1957/12/14	33.53	-
76	-23.6597	27.6497	-	-	-
77	-23.6566	27.67637	-	-	-
78	-23.6569	27.67664	-	-	-
79	-23.6571	27.67692	1957/12/14	39.62	-
83	-23.6855	27.54664	-	-	-
85	-23.7263	27.64192	1956/09/15	9.14	-
86	-23.7263	27.64192	1956/10/10	6.4	-

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<b>Geosite Info Identifier</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Water Level Measurement Date</b>	<b>Water Level (mbgl)</b>	<b>Water Use</b>
96	-23.6174	27.56637	-	-	-
102	-23.643	27.64192	1965/08/11	24.08	-
103	-23.631	27.64193	-	-	-
104	-23.6313	27.64192	1953/10/07	33.53	-
105	-23.6316	27.64194	1958/04/09	30.48	-
107	-23.593	27.66637	-	-	-
114	-23.6277	27.6497	1957/02/02	33.53	-
115	-23.6338	27.6497	-	-	-
116	-23.6341	27.64971	1955/08/18	42.67	-
117	-23.6335	27.6497	-	-	-
118	-23.6341	27.64972	1955/09/17	51.82	-
119	-23.6338	27.6497	1955/10/07	35.05	-
128	-23.6727	27.53609	-	-	-
150	-23.6241	27.57192	-	-	-
152	-23.6244	27.57192	1958/02/19	21.34	-
161	-23.6146	27.62527	1960/08/05	24.38	-
162	-23.6141	27.62526	-	-	-
163	-23.6138	27.62528	1960/08/16	27.43	-
164	-23.6135	27.62526	1954/03/02	23.77	-
165	-23.6124	27.62637	1990/06/14	23	-
166	-23.6121	27.62664	-	-	-
167	-23.6127	27.62637	-	-	-
168	-23.613	27.62553	-	-	-
169	-23.6132	27.62553	-	-	-
178	-23.6319	27.6422	1991/07/25	24	-
179	-23.6321	27.66026	-	-	-
180	-23.6324	27.65498	-	-	-
182	-23.6632	27.74414	-	-	-
261	-23.6966	27.62053	1955/10/10	3.05	Stock Watering
262	-23.6969	27.62081	1964/10/01	20.42	-
263	-23.6969	27.62109	-	-	-
264	-23.6971	27.62137	1965/05/11	18.29	Stock Watering
265	-23.6974	27.62164	1952/04/28	60.96	-
266	-23.6977	27.62192	1952/06/05	27.43	Domestic
271	-23.7424	27.55803	1972/07/27	23.16	Stock Watering
273	-23.6632	27.68636	1953/12/18	35.66	Irrigation

Geosite Info Identifier	Latitude	Longitude	Water Level Measurement Date	Water Level (mbgl)	Water Use
274	-23.6632	27.6863	1980/05/28	15	-
275	-23.6632	27.68637	1980/06/03	50	-
276	-23.6632	27.68636	-	-	-
277	-23.6632	27.68638	1980/06/23	50	-
301	-23.7216	27.55803	1953/12/05	3.35	Agriculture
302	-23.7216	27.55804	1953/11/16	1.83	-
303	-23.7216	27.55804	1953/11/16	1.83	-
312	-23.6507	27.59971	1954/03/11	19.81	-
347	-23.716	27.62442	1995/10/03	64	-
348	-23.7116	27.62803	-	-	-
10	-23.7582	27.59248	1957/09/17	7.32	-
12	-23.7588	27.59303	1963/11/30	18.29	-

The GRIP data presented in Table 21 has also been plotted on Figure 33 indicating five GRIP boreholes within the 8 km buffer area.

**Table 21: GRIP Borehole Data within the Study Area**

Borehole ID	Latitude	Longitude	Current status	Water Level (mbgl)	Borehole Depth (m)
H21-0668	-23.69438	27.62591	Destroyed	32.54 m	-
H21-0525	-23.64426	27.64834	-	-	-
H21-0526	-23.66763	27.67558	-	-	-
H21-0667	-23.67939	27.67733	-	32.54	300
H21-0666	-23.68264	27.67292	-	33.31	216
H21-0670	-23.71166	27.65713	-	3.96	213

Monitoring borehole data was also obtained for the Matimba Power Station. The data for the Matimba Power Station was obtained from GHT Consulting Scientists, who conducted the surface and groundwater monitoring from 2005 to 2012 as well as previous monitoring conducted at the site.

The groundwater level monitoring for the Matimba Power Station monitoring boreholes located within the 8km radius of the power station are presented in Table 22. In total there are 40 boreholes located within this radius, monitoring areas in close proximity to the ash disposal facility as well as the power station, although several boreholes are not functional. The water levels in these boreholes ranged from 2.75mbgl to 29.95mbgl.

Monitoring conducted by GHT Consulting Scientists in 2012 shows that of the boreholes monitoring at the existing ash disposal facility, two boreholes that were on the southern perimeter or south and downstream of the ash facility have been destroyed: B30 was covered with ash and not sealed correctly, creating a pathway for contaminant transport and B35 has been destroyed due to maintenance work. Borehole B12 is currently blocked.

**Table 22: Matimba Power Station Monitoring Borehole Data**

BH ID	Latitude	Longitude	Borehole locality	Depth (m)	Water level (m)
B01	-23.701283	27.61905	Monitoring borehole, North-eastern corner of ash stack	10	7.68
B02	-23.704067	27.602933	Monitoring borehole, northern perimeter of ash stack	30	20.18
B03	-23.6972	27.617717	Monitoring borehole, northern-eastern corner northern ash water collecting dam P05	13	14.41
B04	-23.66935	27.594967	Monitoring borehole western perimeter of old rehabilitated waste site.	15	11.85
B05	-23.6658	27.59565	Monitoring borehole northern perimeter of old rehabilitated waste site	15	7.42
B06	-23.662383	27.599733	Monitoring borehole north-eastern corner of CSP, North of transfer house.	13	9
B07	-23.663607	27.604917	Monitoring borehole northern perimeter of CSP, North of conveyer	13	5.38
B08	-23.6591	27.608867	Monitoring borehole north western corner of CSP, dirty water runoff dams	13	6
B09	-23.65755	27.613367	Monitoring borehole north –eastern corner of CSP dirty water run-off dams P02	7&25	3.78
B10	-23.6687	27.633667	Monitoring borehole southern corner of station drain dams POD	6	3.75
B11	-23.671433	27.631983	Monitoring borehole eastern corner of station drain dams POD	6	4.5
B12	-23.698383	27.617867	Monitoring borehole, south-eastern corner of northern ash water collecting dam P05	5.5	Dry/blocked
B13	-23.65225	27.61495	Monitoring borehole North –Western corner of Marapong.downstream of CSY.B08,B09,B25,&B34	13	7.45
B14	-23.50885	27.654583	Monitoring borehole west of Marapong sport grounds. Downstream of CSY,B08,B09,B25,&B13	13	6.89
B15	-23.65315	27.632083	Monitoring borehole in Marapong village, house 2883.downstream of CSY,B08,B09,B25,B34,B13&B34	14	2.75
B16	-23.665217	27.639667	Monitoring borehole North –East of station drain dams POD on private farm Peerboom 466.downstream from P03,B10 &B11	13	9.45
B17	-23.663667	27.652267	Monitoring borehole North –East of station drain dams P03, on the private farm Peerboom 466.downstream from P03,B11,&B16	30	No access
B18	-23.670735	27.651698	Monitoring borehole east of the station drain dams P03 on private farm Eendracht 505.downstream from P03,B10 & B19	~	11.31
B19	-23.669868	27.640573	Monitoring borehole east of station drains dams P03,on the private farm Eendracht 505.downstream from P03,B10,B11 & B19	~	6.43
B20	-23.697317	27.624133	Monitoring borehole, east of water return dams P05 next to fence. Downstream of	17	14.47

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<b>BH ID</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Borehole locality</b>	<b>Depth (m)</b>	<b>Water level (m)</b>
			P05, B03 B12		
<b>B21</b>	-23.701533	27.62355	Monitoring borehole, North-east of ash stack next to fence. Downstream of ash stack, P05, B01, B03 & B12	15	6.45
<b>B22</b>	-23.699983	27.636833	Monitoring borehole, north-east of ashing area of private farm Altopostyd 506. Downstream of ash stack, P05, B01, B03, B12, B20 & B21.	25	17.41
<b>B23</b>	-23.714267	27.621667	Monitoring borehole, eastern perimeter of ash stack & north-eastern corner of eastern ash water collecting dam P06	12	7.96
<b>B24</b>	-23.72055	27.623517	Monitoring borehole, north-east of ashing area of private farm Worcester 520. Downstream of ash stack P06, B23 & B29	11	2.88
<b>B25</b>	-23.6553	27.604267	Monitoring bore north of CSY inside security area at new development. Downstream of CSP,B06,B07,&B34	19	Damaged
<b>B26</b>	-23.6699	27.598367	Monitoring borehole eastern perimeter of old rehabilitated of old rehabilitated waste site	13	Dry
<b>B27</b>	-23.669633	27.610067	Monitoring borehole east of fuel tanks and filling stations in power station area	9	4.46
<b>B28</b>	-23.6679	27.600017	Monitoring borehole south –western corner of CSP north of ash transfer house	12	5.8
<b>B29</b>	-23.720467	27.617117	Monitoring borehole south-eastern corner of ash stack	13	5.9
<b>B30</b>	-23.719017	27.61355	Monitoring borehole southern perimeter of ash stack	11	Destroyed
<b>B31</b>	-23.723533	27.605833	Monitoring borehole south of ash stack. Downstream of ash stack, B30 & B35	19	13.96
<b>B32</b>	-23.64485	27.5932	Monitoring borehole west of sewage plant between plant and old natural ponds.	24	20.28
<b>B33</b>	-23.644667	27.595167	Monitoring borehole east of sewage plant next to dirt road.	25	20.48
<b>B34</b>	-23.658083	27.60755	Monitoring borehole north of CSY at access gate to irrigation dam P08	9	5.88
<b>B35</b>	-23.7145	27.602383	Monitoring borehole south and downstream of ash stack.	7	Destroyed
<b>B36</b>	-23.634117	27.648783	Monitoring borehole north-east of power station area on private farm Zongezien 467. Borehole at farm house	~	No access
<b>B37</b>	-23.634117	27.6449	Monitoring borehole north –east of power station area on private farm Zongezien 467. Borehole at farm house	33	29.98
<b>B37i</b>	~	~	Monitoring borehole north – east of power station area on private farm Zongezien 467	~	Location unknown
<b>B38</b>	-23.6538	27.674017	Monitoring borehole east of power station area on private farm peerboom 466. Borehole at farm house .Downstream from B17 & B18	NA	Collapsed
<b>B40</b>	~	~	Monitoring borehole east of power station area on private farm peerboom 466.	~	Location unknown

BH ID	Latitude	Longitude	Borehole locality	Depth (m)	Water level (m)
			Downstream from B17&B18		

\*Data obtained from GHT Consulting Scientists, 2012

The monitoring boreholes surrounding the Grootegeluk mine are presented in Table 23. An extensive groundwater monitoring network surrounds the mine with a large proportion located within the 8km study area. The water levels in these boreholes ranged from 3mbgl to 60.95mbgl. The variation in water levels is possibly due to the de-watering activities of the Grootegeluk open cast mine.

**Table 23: Grootegeluk Mine Monitoring Borehole Data**

Borehole ID	Latitude	Longitude	Elevation (mamsl)	Water Level Elevation (mamsl)	Water Level (mbgl)
GHK17	-23.66506	27.68348	845.67	816.65	29.02
GHK26	-23.6612	27.68553	843.7	818.2	25.5
NN11	-23.68831	27.58406	877.76	854.04	23.72
NN12	-23.69057	27.58162	880.36	830.4	49.96
NN13	-23.68834	27.58165	879.99	856.18	23.81
OBS2	-23.65586	27.54733	902.41	892.85	9.56
TE66	-23.67933	27.57422	883.51	862.03	21.48
TE70	-23.68608	27.5767	881.76	862.46	19.3
TE88	-23.68609	27.5693	885.6	875.54	10.06
TE89	-23.68256	27.57424	882.78	865.13	17.65
TE90	-23.68176	27.5423	894.67	841.32	53.35
WB19B	-23.65576	27.5473	902.38	873.28	29.1
WB25	-23.66033	27.56523	895.3	890.57	4.73
WB33	-23.65708	27.54863	901.35	888.4	12.95
WB34	-23.65471	27.54765	904.19	881.24	22.95
WB35	-23.65532	27.54468	902.44	871.46	30.98
WB36	-23.65809	27.54053	901.7	883.36	18.34
WB40	-23.66874	27.56888	895.24	888.52	6.72
WB42	-23.66978	27.55489	893.58	883.53	10.05
WB43	-23.66533	27.55837	894	884.68	9.32
WB45	-23.6649	27.56437	895.01	889.64	5.37
WB46	-23.66846	27.5643	894.11	890.37	3.74
WB47	-23.65798	27.56088	896.72	891.91	4.81
WB48	-23.65475	27.56388	896.02	891.77	4.25
WB49	-23.65794	27.55955	896.78	889.73	7.05
WB50	-23.65078	27.56328	896.61	880.61	16
WB51	-23.6606	27.56676	895.39	885.07	10.32



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<b>Borehole ID</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Elevation (mamsl)</b>	<b>Water Level Elevation (mamsl)</b>	<b>Water Level (mbgl)</b>
WB9	-23.68162	27.53508	897.7	839.35	58.35
WBR14P1	-23.6452	27.54194	911.51	882.64	28.87
WBR14P2	-23.6452	27.54194	911.51	882.75	28.76
WBR14P3	-23.6452	27.54194	911.51	897.26	14.25
WBR15	-23.64467	27.55609	902.24	890.77	11.47
WBR16	-23.64011	27.54922	908.68	886.36	22.32
WBR17	-23.67195	27.54886	894.38	874.59	19.79
WBR18	-23.67015	27.55221	892.98	888.46	4.52
WBR2	-23.65657	27.57637	897	888.6	8.4
WBR22P2	-23.68158	27.5668	886.65	854.55	32.1
WBR24	-23.63901	27.57888	887.27	875.92	11.35
WBR26	-23.66612	27.5617	894.67	889.5	5.17
WBR28	-23.64722	27.5516	905.54	888.83	16.71
WBR29	-23.66501	27.55661	894.9	889	5.9
WBR3	-23.63658	27.56375	893.17	890.17	3
WBR30	-23.66564	27.55663	894.73	888.93	5.8
WBR31	-23.66472	27.55734	894.88	888.97	5.91
WBR32	-23.64543	27.56684	893.6	888.2	5.4
WBR36	-23.67355	27.57018	892.82	887.06	5.76
WBR37	-23.70176	27.57775	895.23	881.03	14.2
WBR37A	-23.70176	27.57786	895.27	881.9	13.37
WBR38	-23.65431	27.6018	873.6	860.25	13.35
WBR39	-23.67662	27.55924	891.02	886.26	4.76
WBR4	-23.64251	27.57335	890.44	887.56	2.88
WBR5P1	-23.63652	27.57322	886.57	884.23	2.34
WBR6P1	-23.64195	27.56813	896.33	896.78	-
WBR6P2	-23.64195	27.56813	896.33	889.59	6.74
WBR7	-23.6422	27.5931	886.94	863.95	22.99
WBR8	-23.62611	27.57597	879.55	867.67	11.88
APL	-23.63539	27.57458	-	-	-
FL1	-23.65051	27.58611	-	-	-
WBR39	-23.67662	27.55924	891.02	-	-
WB31	-23.60821	27.57079	882.02	-	-

### **7.1.2 Groundwater Flow Directions**

The water level data obtained from the Matimba Power Station Monitoring programme and selected data from the Grootegeluk monitoring was used to contour the groundwater levels and determine the groundwater flow direction. Figure 34 presents the general groundwater flow direction across and around the site. The groundwater flow direction is an easterly direction across the study area, towards the Sandloop River.

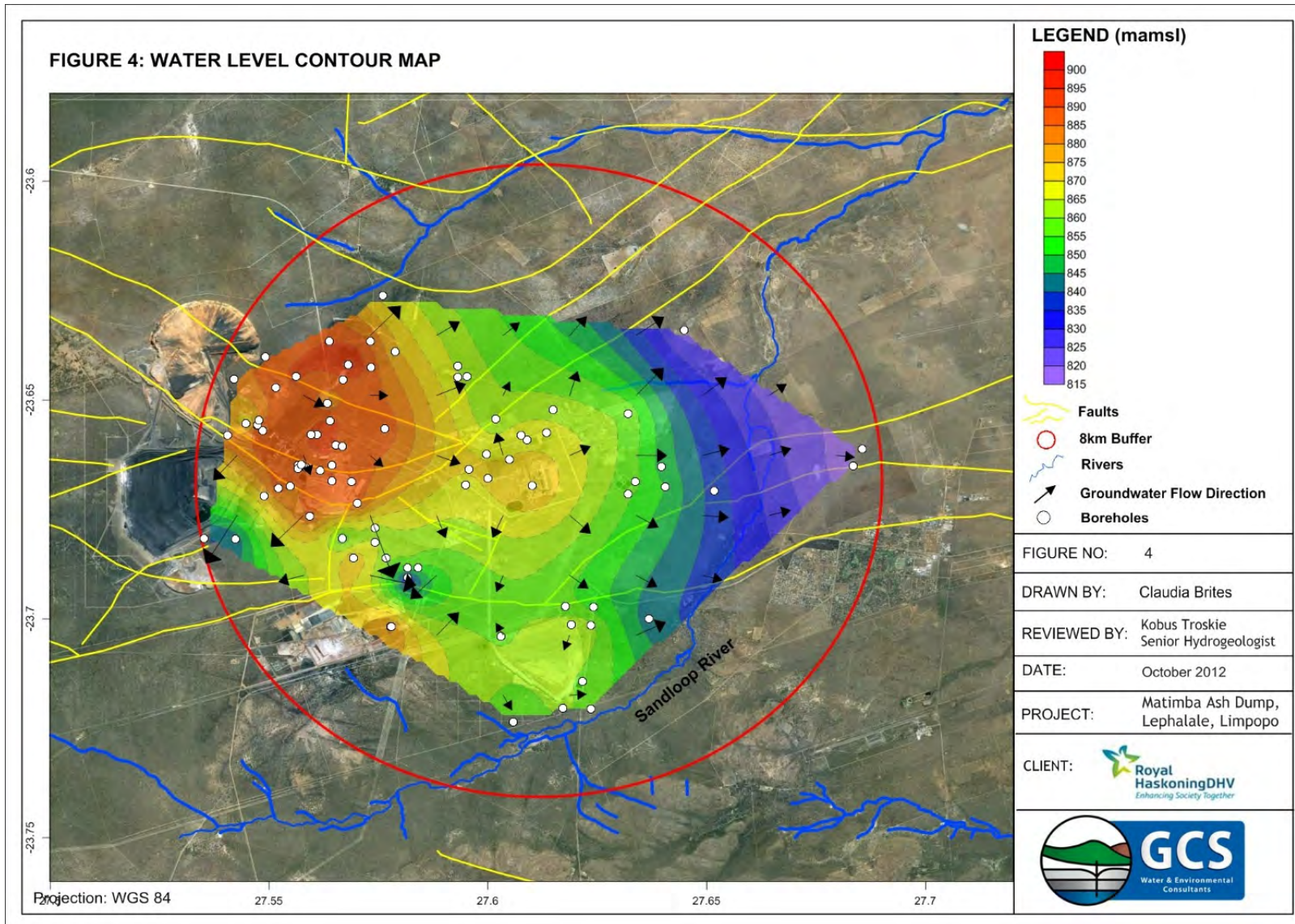


Figure 34: Groundwater Flow Direction

### 7.1.3 Bayesian Estimate

The elevations of the boreholes were plotted against the water level elevations in mamsl (metres above mean sea level), in order to determine if there is a correlation between the two variables which would indicate that the groundwater levels follow the topographical slope of the area.

Figure 35 below, plots both the Grootegeluk Mine and Matimba Power Station monitoring boreholes data set. This indicates a 55% correlation, which suggests a poor relationship between the groundwater levels and the topography.

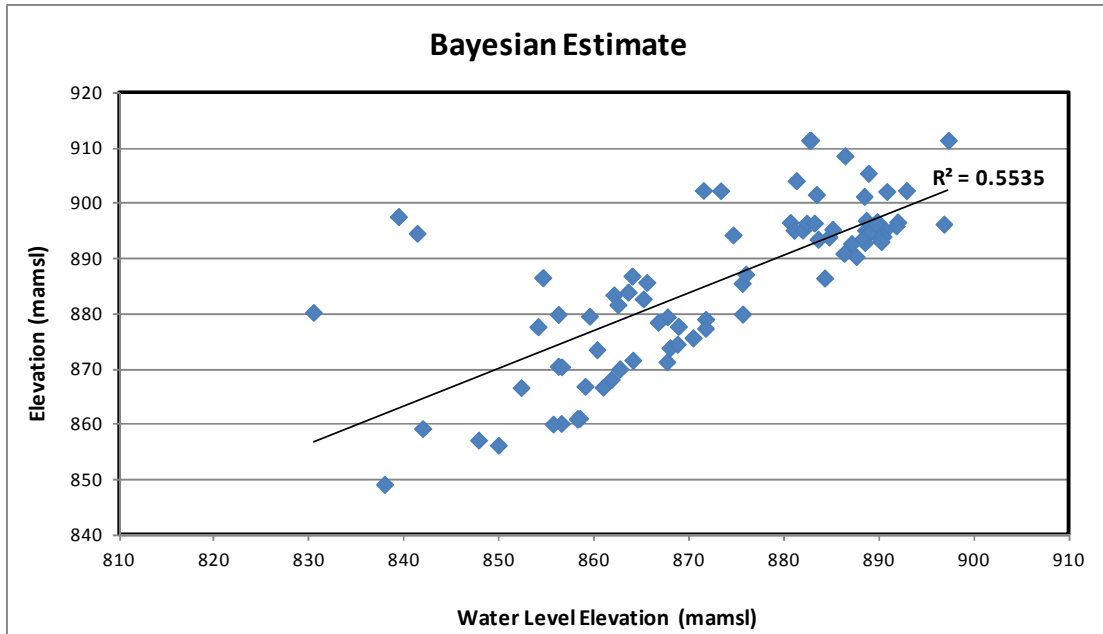


Figure 35: Bayesian Estimation– Grootegeluk Mine and Matimba Power Station Boreholes

However, Figure 36 only plots the Matimba borehole data set which indicates a 76% correlation. This suggests a better correlation of the elevation with the groundwater level. Therefore, this indicates that the Grootegeluk monitoring boreholes do not show a good correlation based on the mining activities and dewatering which takes place in the area.

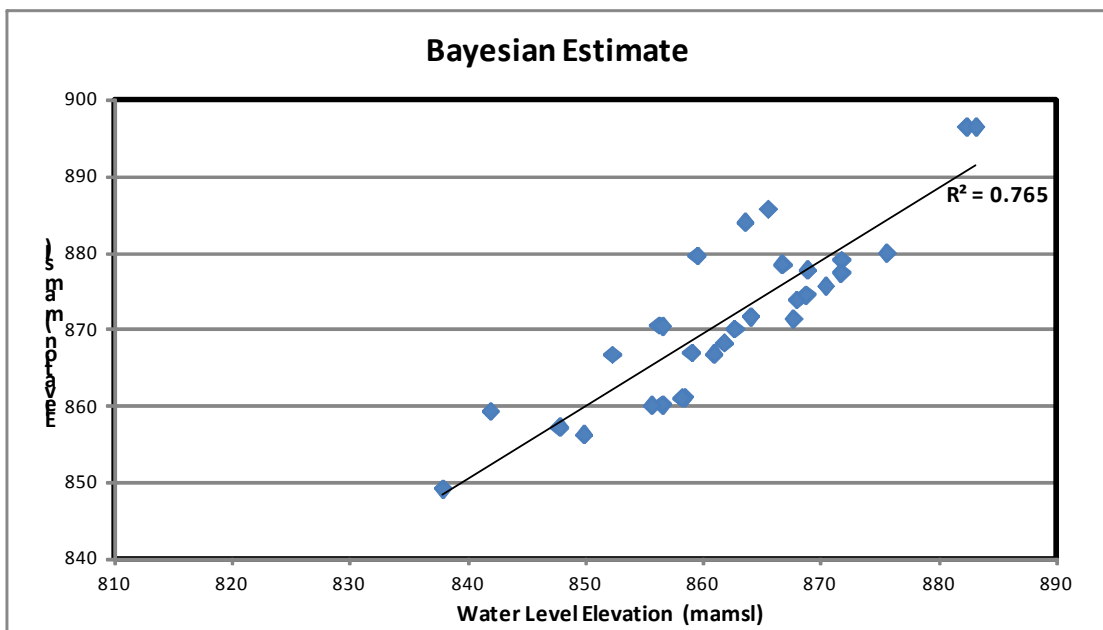


Figure 36: Bayesian Estimation - Matimba Power Station Boreholes

#### **7.1.4 Groundwater Chemistry**

All functional boreholes in close proximity to the existing ash disposal facility were sampled as part of the monitoring conducted by GHT Consulting Scientists in May 2012.

- **Existing Ash disposal facility**

Boreholes B12, B30 and B35 were destroyed/dry and therefore not sampled. Majority of the boreholes were classified as above the recommended limit when compared to the SABS South African National Standard: Drinking Water, SANS 241-2: 2011 limit.

The chemistry indicated several parameters which exceeded the limit in certain boreholes including, Electrical Conductivity (EC), sodium, chloride, sulphate, manganese and iron. The non compliance of the water quality within the boreholes is potentially from the ash disposal facility<sup>8</sup>.

Boreholes B29 and B31 are located down-gradient of the ash disposal facility, with B29 located adjacent to the ash disposal facility and B31 further from the ash disposal facility. The chemistry indicated excessive concentrations of certain parameters.

- The EC values exceeded the SANS 241-1:2011 of 170mS/m, with values of 1374 and 1082mS/m in B29 and B31 respectively.
- The sodium concentration exceeded the SANS limit of 200mg/l with concentrations of 2081mg/l in and 2147mg/l in B29 and B31 respectively.
- The chloride concentrations exceeded the SANS limit of 300mg/l with concentrations of 4256 and 3657mg/l in B29 and B31 respectively.

Therefore, it is evident that certain parameters are present in excessive concentrations directly down-gradient of the ash disposal facility.

Borehole B24, located further down-gradient from B29, indicated high sulphate concentrations, however, more parameters were compliant in comparison to B29, located closer to the ash disposal facility.

Borehole B23 is located down-gradient and adjacent to the ash disposal facility. The chemistry indicated high concentrations of indicator parameters (electrical conductivity, sodium, chloride and sulphate).

Boreholes B3 and B22 indicated compliance with the SANS standard for parameters analysed. B22 is located quite a distance from the ash disposal facility and B3 is up-gradient.

- **Coal Stockyard**

Majority of the boreholes in this area indicated elevated parameters, except for boreholes B13 and B15 indicated suitable water quality which indicates that the coal stockyard has not impacted on the water quality. Several parameters exceeded the limits in some of these boreholes, namely, sulphate, fluoride, sodium, magnesium and chloride.

The boreholes located within the rehabilitated waste site, indicated elevated sodium, chloride, iron and nitrate concentrations.

- **Power Station**

The water quality within these boreholes were, for the most part, satisfactory. One borehole, B18 indicated elevated electrical conductivity, sodium, calcium, magnesium, chloride, sulphate and nitrate. Borehole B27 indicated elevated nitrate.

#### **7.1.5 Groundwater Use**

Groundwater abstraction occurs within the study area for the following purposes:

- Primarily stock or game watering

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<sup>8</sup> GHT Consulting Scientists, 2012.

- Domestic use
- Agricultural use
- Reticulated (piped) water is supplied to the area, either via the municipality, Eskom, or Grootegeluk Coal Mine

#### **7.1.6 Electrical Conductivity**

The Electrical Conductivity (EC) measurements were recorded by GHT Consulting Scientists for the first quarter of 2012. The EC measurements were used to create a contour map indicating areas of elevated EC measurements, presented in Figure 37 below. The contours indicate elevated EC measurements surrounding the existing ash disposal facility located within the southern portion of the study area, with boreholes B29 and B31, located down-gradient of the ash disposal facility indicated elevated EC concentrations. Similarly, borehole B18, which is located east of the station drain dams, monitoring the power station area, indicated elevated EC concentrations within this borehole.

- **Impacts**

Therefore, the possible sources of contamination or infrastructure that may impact on the groundwater resources include:

- Pollution control dams
- Fuel, oil used in the running / maintenance of equipment
- Ash that is disposed off at the facility
- Matimba Power Station operations
- Existing ash disposal facility
- Grootegeluk mining operations

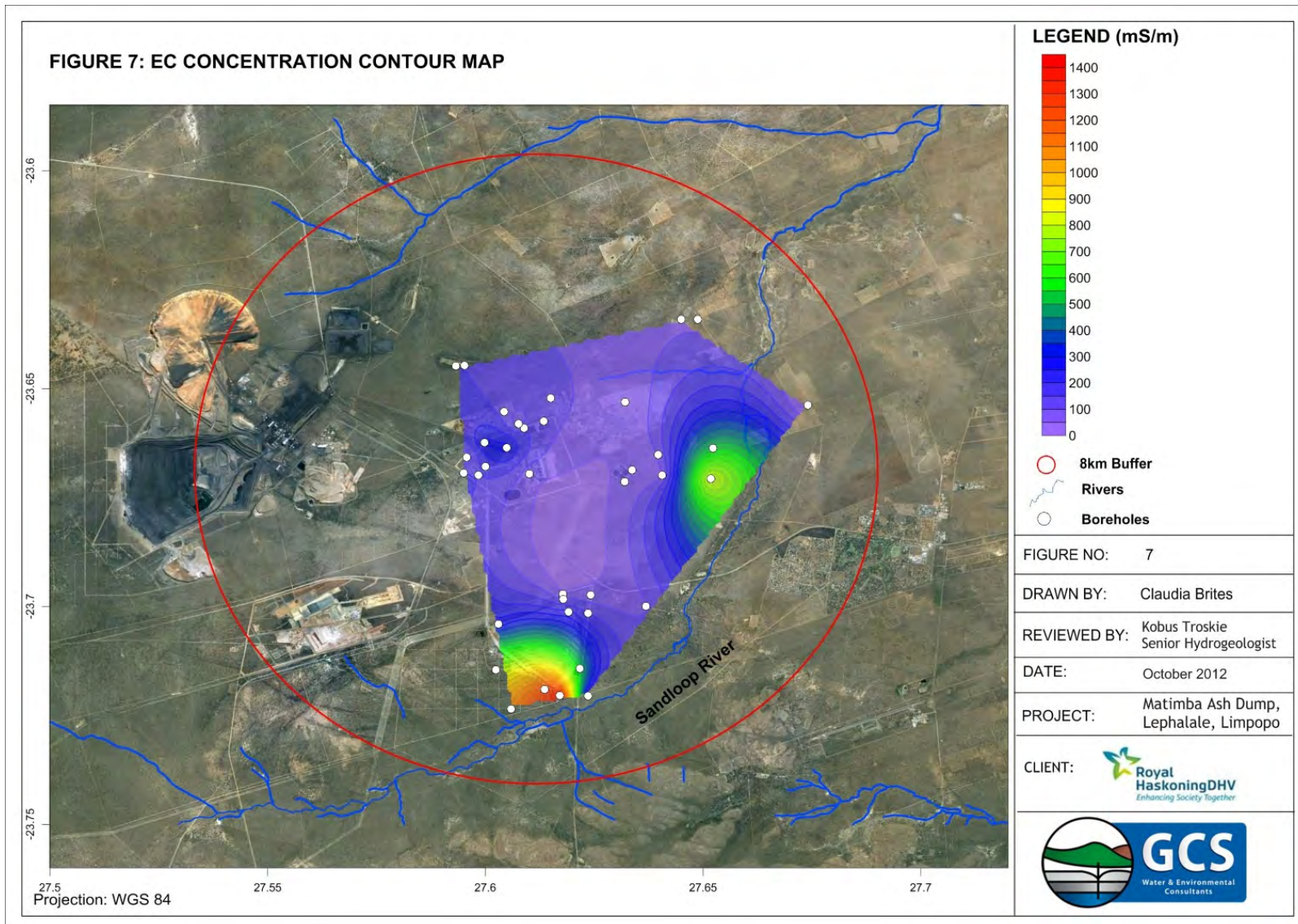


Figure 37: EC Concentration Contour Map

## 7.2 Hydrology

The potential impacts on hydrology include:

- Deterioration of the Sandloop river water quality due to seepage or overland storm water flows.
- Minimal stream flow reductions could potentially occur
- Spillages from substances such as oil could be transported to the Sandloop river causing pollution
- Disturbance of the soil surface could cause increased run off leading to transport of contaminants to downstream users.

## 7.3 Surface Water

As mentioned in the Chapter 6, the Sandloop River is the major natural surface water resource that was identified in the study area. Although not permanent, this is a river and if it were to be 'covered' in the footprint of the ash disposal facility, this would have significant implications for the river, as riparian habitat would be lost, and the natural hydrology of the entire catchment area it drains (albeit a small area) would be disrupted and permanently altered.

### 7.3.1 *Direct Impacts related to loss of Habitat*

The proposed ash disposal facility would have a highly significant impact on surface water resources if surface water features were to fall within the area that would be occupied by the ash disposal facility. This would lead to complete loss of riparian and aquatic habitat within the affected reach of the surface water feature. In the case of linear drainage features, the surface and sub-surface hydrology of these features would be completely altered, as the ash disposal facility would form a physical barrier to the movement of water along the feature. This would have 'knock-on' downstream impacts on the watercourse as these stretches would be deprived of water input. Physical habitat for the biota within the riparian and aquatic components of the feature would be lost, and this would lead to a significant localised ecological impact and a significant adverse impact on the resource quality. Ecosystem processes, particularly those relating to linear linkages along watercourses and drainage lines would be severely disrupted.

### 7.3.2 *Indirect Pollution Impacts*

Indirect pollution impacts would relate to the entry of ash or associated chemical pollutants into a surface water feature through seepage or by being washed into the surface water feature by runoff or other agents of mobility. Water that has interacted with ash from the disposal facility is typically high in sodium and sulphates that could act as pollutants if transported into nearby natural drainage systems.

From the proposed ash disposal facility, seepage could cause water from the ash disposal facility to move horizontally above the surface of the impermeable Swartrant Sandstone southwards towards the Sandloop River or other drainage lines identified. If this seepage water were to surface or mix with natural sub-surface flow within the river, this could cause pollution. The exact groundwater flow dynamics of the area surrounding the proposed new ash disposal facility will need to be investigated as part of the hydrogeological study being undertaken as part of this EIA. The information gathered by this investigation will need to be assessed and incorporated into the EIA-phase surface water study. It should be noted that the potential for seepage of water from the proposed ash disposal facility would be significantly reduced if the base of the ash disposal facility was effectively lined to prevent movement of water into the ground.



## 7.4 Soils and Agricultural Potential

The interpretation of the land use and land capability results yielded a number of aspects that are of importance to the project.

- **Agricultural Potential**

The agricultural potential of the general study area is low and limited to extensive grazing mainly due to the relatively low and erratic rainfall but also due to soil constraints. The soils are generally variable in depth and are generally very sandy leading to a poor cropping potential. In the presence of irrigation water, soils could be used for irrigated agriculture. Water however, is the limiting factor in the area regarding the aforementioned land use. Therefore, the impact on agriculture is very low.

### 7.4.1 Anticipated Soil / Land use / Agriculture Impacts

- **Physical Soil Disturbance due to Construction and Disposal Activities**

Direct impacts are associated with the soils that will be covered during the construction of the proposed ash disposal facility. Soils could also be contaminated due to spillage, leakage, incorrect storage and handling of chemicals, oils, and fuel during construction and operation.

Indirect impacts could arise in the form of soil erosion, dust generation and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites.

- **Impacts on Current Land Use due to Construction Activities**

Direct impacts are associated with the soils that will be removed during the construction of the proposed ash disposal facility. Indirect impacts could arise in the form of soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites.

- **Overall Impacts**

The overall impacts of the proposed continuous ash disposal facility on soils and agriculture will be low due to the low agricultural potential of the general area which is as a result of very sandy soils. Due to the relatively low rainfall, impacts on the soils such as dust generation are considered more problematic and will have to be addressed in more detail in the EIA process. Soil erosion is considered to be of low risk due to the level nature of the terrain. Soil contamination is also a possible impact during construction and operation.

## 7.5 Biodiversity

The following impacts/issues were identified that could affect the biodiversity of the study area adversely:

- Direct impacts on threatened flora species
- Direct impacts on protected flora species
- Direct impacts on threatened faunal taxa
- Direct impacts on common fauna species/ faunal assemblages (including migration patterns, corridors, etc)
- Human - Animal conflicts
- Loss or degradation of natural vegetation/ Sensitive habitat
- Indirect Impacts on Surrounding Habitat / Species and Ecosystem Functioning

The above impacts will occur mainly during the construction of the ash disposal facility.

Impacts of a cumulative nature include:

- Impacts on SA's conservation obligations and targets
- Increase in local and regional fragmentation/ isolation of habitat
- Increase in environmental degradation, pollution (air, soils, surface water).

Direct impacts include any effect on populations of individual species of conservation importance and on overall species richness. This includes impacts on genetic variability, population dynamics, overall species existence or health and on habitats important for species of conservation consideration. In addition, impacts on sensitive or protected habitat are included in this category, but only on a local scale.

#### **7.5.1 Direct Impact on Threatened Flora Species**

This direct impact results in physical damage or destruction of Red Data species/ communities, areas where these species are known to occur or areas that are considered particularly suitable for these species. Threatened plant species, in most cases, do not contribute significantly to the species richness of an area in terms of sheer numbers, as there are generally few of them, but a high ecological value is placed on the presence of such species in an area as they represent an indication of pristine habitat conditions. Conversely, the presence of pristine habitat conditions can frequently be accepted as an indication of the potential presence of species of conservation importance, particularly in moist habitat conditions.

Red Data species are particularly sensitive to changes in their environment, having adapted to a narrow range of specific habitat requirements. Changes in habitat conditions resulting from human activities is one of the greatest reasons for these species having a threatened status. Surface transformation/ degradation activities within habitat types that are occupied by flora species of conservation importance will ultimately result in significant impacts on these species and their population dynamics. Effects of this type of impact are usually permanent and recovery or mitigation is generally not perceived as possible.

The likelihood of Red Data flora species occurring within the study area is relatively high and the conservation of these areas is likely to provide protection of plant species of conservation importance.

#### **7.5.2 Direct Impacts on Protected Flora Species**

Results of the preliminary investigation revealed the presence of numerous protected trees within the study area and it is inevitable that a number of protected tree species will be impacted on during the construction phase. These species are namely: *Acacia erioloba*, *Adansonia digitata*, *Ammocharis coranica*, *Boscia albitrunca*, *Combretum imberbe*, *Securidaca longipedunculata*, *Sclerocarya birrea* subsp. *Africana*, and *Spirostachys Africana*.

Similar to Red Data plants, these species do not contribute significantly towards the local and regional species richness, but their presence indicates a relatively pristine status of the habitat. Preservation of these species is a social obligation in light of increasing pressure on these species that causes a continuous decline and an eventual inclusion in conservation categories. Protected plant species are known to occur in the study area; this impact is therefore relevant.

#### **7.5.3 Direct Impacts on Threatened Fauna Taxa**

The presence of Red Data fauna species cannot be discounted at this stage and any disturbance therefore represents a direct and significant impact on these species. While some species are highly mobile and will ultimately be able to avoid impacts that result from the proposed development, some will not be able to avoid effects of microhabitat destruction. A direct approach, which is likely to be hugely costly, can be implemented in order to capture and relocate some animals to adjacent suitable habitat. Similar to Red Data plants, the presence of Red Data animal species is seen as a significant attribute to the biodiversity of an area. Any impact is therefore viewed as significant. Additional aspects that will be affected include migration patterns and suitable habitat for breeding and foraging purposes.

#### **7.5.4 Direct Impacts on Common Fauna Species / Faunal Assemblages**

The presence of diverse faunal assemblages in most areas is accepted. Considering the low levels of habitat transformation and degradation on a local scale, animal species are likely to evacuate towards adjacent areas of natural habitat during periods of high impact. While the tolerance levels of most animal species is generally of such a nature that surrounding areas will suffice in their habitat requirements, some species are not able to

relocate, such as ground living and small species. The proposed activity will therefore result in severe impacts on these species.

In light of the low fragmentation and habitat isolation levels of the region, it is reasonable to assume that the animals utilising habitat within the proposed areas will also migrate extensively across the region for various reasons. Foraging, available water, food sources, breeding patterns and seasonal climate changes include some of the more obvious explanations for migration of animals.

While most of the larger mammal species (ungulates) are restricted in their movement by fences, small and medium sized animals, that include predators, burrowing species, small mammals, invertebrate species, reptiles, amphibians, etc. utilises all available natural habitat as either corridors or habitat. The loss of a large area will affect the migration and daily movement patterns of a number of species that are present in the immediate region.

#### **7.5.5 Human – Animal Conflict**

While animals generally avoid contact with human structures, they do grow accustomed to structures after a period. While the structures are visible, injuries and death of animals could potentially occur because of accidental contact. An aspect that is of concern is the presence of vehicles on access roads, leading to road kills, particularly amongst nocturnal animals that abound in the study area.

The presence of personnel within the development area during construction and maintenance periods will inevitably result in limited, contact with animals. While most of the larger animal species are likely to move away from humans, encounters with snakes, spiders, scorpions and even predators remain likely. Similarly, the presence of humans within areas of natural habitat could potentially result in killing of animals by means of snaring, poaching, poisoning, trapping, etc.

Furthermore, the creation of artificial habitats and the abundance of litter and spoils that are associated with any construction and development site will attract prey species such as rodents, exotic birds and pets (feral cats and dogs). Strongly associated with the presence of these animals are predators that include venomous snakes, larger raptors, wild cat species (Cerval, Leopard, Caracal, etc.), Jackal, Hyena, Honey Badger, etc. These species are frequently regarded with false beliefs and killed for little reason. Much information can be drawn from environmental aspects of the nearby Medupi Power Station.

While most of the significant impacts are associated with habitat clearance that precedes the actual development and operational phases, this impact is also particularly relevant during the period when construction activity peaks and worker numbers are high.

#### **7.5.6 Loss or Degradation of Natural Vegetation / Sensitive Habitat**

The loss or degradation of natural / sensitive vegetation represents a potential loss of habitat and biodiversity on a local and regional scale. Sensitive habitat types might include ridges, rivers, streams, pans and localised habitat types of significant physiognomic variation and unique species composition. These areas represent centres of atypical habitat and contain biological attributes that are not frequently encountered in the greater surrounds. A high conservation value is generally ascribed to floristic communities and faunal assemblages that occupy these areas as they contribute significantly to the biodiversity of a region.

The vegetation is indicated to be highly representative of the regional vegetation type and is, for most parts, in a pristine condition, implying that the species composition, structure and other floristic attributes does not indicate variance on a local or regional scale.

The larger region is furthermore characterised by relative low transformation and fragmentation factors. Therefore, the existing ecological connectivity is significant in the functioning of the regional and local ecological processes. Indirect effects resulting from construction and operational activities on processes or factors that maintain ecosystem health and character, including the following:

- Disruption of nutrient-flow dynamics;
- Introduction of chemicals into the ground- and surface water through leaching;
- Impedance of movement of material or water;
- Habitat fragmentation;
- Changes to abiotic environmental conditions;
- Changes to disturbance regimes, e.g. increased or decreased incidence of fire;
- Changes to successional processes;
- Effects on pollinators; and
- Increased invasion by plants and animals not endemic to the area.

Changes to factors such as these may lead to a reduction in the resilience of ecological communities and ecosystems or loss or changes in ecosystem function.

#### **7.5.7 Indirect Impact on Surrounding Habitat / Species and Ecosystem Functioning**

Surrounding areas and species present in the direct vicinity of the study area could potentially be affected by indirect impacts resulting from construction and operational activities. This indirect impact also includes adverse effects on any processes or factors that maintain ecosystem health and character, including the following:

- Disruption of nutrient-flow dynamics;
- Introduction of chemicals into the ground- and surface water through leaching;
- Impedance of movement of material or water;
- Habitat fragmentation;
- Changes to abiotic environmental conditions;
- Changes to disturbance regimes, e.g. increased or decreased incidence of fire;
- Changes to successional processes;
- Effects on pollinators; and
- Increased invasion by plants and animals not endemic to the area.

Changes to factors such as these may lead to a reduction in the resilience of ecological communities and ecosystems or loss or changes in ecosystem function. Furthermore, regional ecological processes, particularly aquatic processes that are dependent on the status and proper functioning of the drainage line, is regarded important. It is well known that the status of a catchment is largely determined by the status of the upper reaches of the rivers. Small drainage lines might be insignificant on a regional scale, but the combined status of numerous such small drainage lines will determine the quality of larger rivers further downstream.

#### **7.5.8 Cumulative Impact – Impacts on SA’s Conservation Obligation and Targets**

This impact is regarded a cumulative impact since it affects the status of conservation strategies and targets on a local as well as national level and is viewed in conjunction with other types of local and regional impacts that affects conservation areas or threatened areas. The importance of vegetation types is based on the conservation status ascribed to regional vegetation types (VEGMAP, 2006) and therefore impacts that result in irreversible transformation of natural habitat is regarded significant.

#### **7.5.9 Cumulative Impact – Increase in Local & Regional Fragmentation/ Isolation of Habitat**

Uninterrupted habitat is a precious commodity for biological attributes in modern times, particularly in areas that are characterised by moderate and high levels of transformation. The loss of natural habitat, even small areas, implies that biological attributes have permanently lost that ability of occupying that space, effectively meaning that a higher premium is placed on available food, water and habitat resources in the immediate surrounds. This, in some instances might mean that the viable population of plants or animals in a region will decrease proportionally with the loss of habitat, eventually decreasing beyond a viable population size. The danger in this type of cumulative impact is that effects are not known or are not visible with immediate effect and normally when these effects become visible, they are usually beyond repair. Impacts on linear areas of natural habitat affect the migratory success of animals in particular.

The general region is characterised by moderate levels of transformation and habitat fragmentation. However, a high degree of connectivity is still present outside development areas. This connectivity is critical in the preservation of pollinator species that provide important ecological services. The isolation of parcels of natural habitat is likely to contribute to loss of genetic variability, decrease in diversity and accentuated impacts from surrounding land uses.

#### **7.5.10 Cumulative Increase in Environmental Degradation, Pollution**

Cumulative impacts associated with the proposed ash disposal facility could lead to initial, incremental or augmentation of existing types of environmental degradation, including impacts on the air, soil and water present within available habitat. Pollution of these elements might not always be immediately visible or readily quantifiable, but incremental or fractional increases might rise to levels where biological attributes could be affected adversely on a local or regional scale. In most cases, these effects are not bound and are dispersed, or diluted over an area that is much larger than the actual footprint of the causal factor. Similarly, developments in untransformed and pristine areas are usually not characterised by visibly significant environmental degradation and these impacts are usually most prevalent in areas where continuous and long-term impacts have been experienced.

## **7.6 Social**

### **7.6.1 Impact on Health**

The primary concern from a social impact perspective of the proposed activity is the potential impact of airborne ash, known as coal fly ash (CFA) on neighbouring communities. Coal fly ash consists of particles formed by mineral transformation in high-temperature combustion processes. CFA is a primary particle emitted, along with soot as a solid from the power plant stack. Exposure to CFA is a health concern because of human exposure to particulate matter is associated with increased respiratory and cardiac disease. While ash from coal-fired power plants is well controlled in general, CFA can still remain a significant fraction of the overall particle exposure for some plant workers and highly impacted communities.<sup>9</sup>

Pollution by CFA must not exceed the legal requirements as set out under the National Environmental Management: Air Quality Act (No. 39 of 2004), national ambient air quality standards for particulate matter. It is crucial to note potential legal ramifications if blown dust or other particulate matter such as CFA causes a nuisance or damage to communities proximal to power stations, as the communities are entitled to institute a civil case against the operators of a station.<sup>10</sup>

Communities that lie in the potentially impacted areas include farm houses, Marapong, Lephalale town, and game reserve. The extent of the impact of the proposed development will only be known once a preferred alternative site has been selected, and once the air quality monitoring studies indicate the range of the potential impacts.

Also worth noting, is the potential for accidents at the ash disposal facility and surrounding areas as a result of dust storms which reduce visibility especially in the windy season. This is uncommon however, the potential must be investigated. Weather patterns will show conditions for the development of dust storms, with the presence of fly ash being a possible accelerant to the storms.

### **7.6.2 Impact on Employment Opportunities**

Job creation is a positive spin-off from any development; the true effects of employment will be felt at household level. However, the labour required for the proposed development is likely to be minimal because ashing is not

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<sup>9</sup> Smith, KR, Veranth, JM, Kodavanti, UP, Aust, AE & Pinkerton, KE 2006. *Acute Pulmonary and Systemic Effects of Inhaled Coal Fly Ash in Rats: Comparison to Ambient Environmental Particles*. *Toxicological Sciences*, Vol 93, no. 2, pp. 390-399.

<sup>10</sup> Roshcon Pty Ltd 2011a. *Matimba Power Station Ash Dump Operating Manual*. Unpublished Technical Report, Johannesburg.

labour intensive. Thus the impact on household economics would also be minimal and of a short (temporary) nature.

### **7.6.3 Impact on Land Use**

The proposed development would have effects on land use in the area. There is evidence that residents utilise natural resources particularly in the northern part of the study area where there is a game reserve. Additionally, the building of further residential (and possibly small scale business outlets in the future within the Marapong and Lephalale communities) may be impacted by airborne ash, unless proper dust prevention measures are taken.

## **7.7 Air Quality**

### **7.7.1 Construction Phase**

During the construction assessment phase it is expected that, the main sources of impact will result from the construction of infrastructure such as the ash disposal facility, channels, ash water return dams, conveyor belts, and roads. These predicted impacts cannot be directly quantified, primarily due to the lack of detailed information related to scheduling and positioning of alternatives and construction related activities. Instead a qualitative description of the impacts has been provided. This involves the identification of possible sources of emissions and the provision of details related to their impacts.

Construction usually consists of a series of different operations, each with its own duration and potential for dust generation. Dust emission will vary from day to day depending on the phase of construction, the level of activity, and the prevailing meteorological conditions.<sup>11</sup>

The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction operations at the site:

- Ash Transport
- Ash disposal site preparation;
- Conveyor belts
- Roads

Access roads are typically constructed by the removal of overlying topsoil, whereby the exposed surface is graded to provide a smooth compacted surface for vehicles to drive on. Material removed is often stored in temporary stockpiles close to the road edge and is re-covered for rehabilitation purposes on the roads and/or on ash disposal facilities. Often however, these unused haul roads are left as is in the event that sections of them could be reused at a later stage.

A large amount of dust emission is generated by vehicle traffic over temporary unpaved roads. Substantial secondary emissions may be emitted from material moved out from the preferred site during grading and deposited adjacent to roads. A positive correlation exists between the amount of dust generated (during vehicle entrainment) and the silt content of the soil as well as the speed and size of construction vehicles. Additionally, the higher the moisture content of the soil the lower the amount of dust generated.

- **Overview of Potential Impacts**

The following components of the environment may be impacted upon during the construction phase:

- ✓ ambient air quality;
- ✓ local residents and neighbouring communities;
- ✓ employees;
- ✓ the aesthetic environment; and
- ✓ possibly fauna and flora

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<sup>11</sup> United States Environmental Protection Agency (USEPA), 1996.

The impact on air quality and air pollution of fugitive dust is dependent on the quantity and drift potential of the dust particles. Large particles settle out near the source causing a local nuisance problem. Fine particles can be dispersed over much greater distances. Fugitive dust may have significant adverse impacts such as reduced visibility, soiling of buildings and materials, reduced growth and production in vegetation and may affect sensitive areas and aesthetics. Fugitive dust can also adversely affect human health. It is important to note that impacts will be of a temporary nature, only occurring during the construction period.

Impact of fugitive dust emissions on employees on site could be significant during the construction phase, but will vary between phases, with level of activity and meteorological conditions.

### **7.7.2 Operational Phase**

This section will aim to deal with the potential air quality impacts which could result due to the proposed operations. Details regarding the source characteristics will be obtained from site layout plans and process specific information provided and a questionnaire filled in by the client. Once all site layouts and final geotechnical works are complete, site specific information should then be sufficient for dispersion modelling and will then be included in the Environmental Impact Assessment Report.

### **7.7.3 Decommissioning Phase**

The decommissioning phase is associated with activities related to the demolition of infrastructure and the rehabilitation of disturbed areas. The total rehabilitation will ensure that the total area will be free draining covered with topsoil and grassed. The following activities are associated with the decommissioning phase:

- Existing buildings and structures demolished, rubble removed and the area levelled
- Remaining exposed excavated areas filled and levelled
- Land and permanent waste piles prepared for re-vegetation

Possible sources of fugitive dust emission during the closure and post-closure phase include:

- Smoothing of stockpiles by bulldozer
- Grading of sites
- Transport and dumping of overburden for filling
- Infrastructure demolition
- Infrastructure rubble piles
- Transport and dumping of building rubble
- Transport and dumping of topsoil
- Preparation of soil for revegetation – ploughing and addition of fertiliser, compost etc.

Exposed soil is often prone to erosion by water. The erodability of soil depends on the amount of rainfall and its intensity, soil type and structure, slope of the terrain and the amount of vegetation cover. Re-vegetation of exposed areas for long-term dust and water erosion control is commonly used and is the most cost-effective option. Plant roots bind the soil, and vegetation cover breaks the impact of falling raindrops, thus preventing wind and water erosion. Plants used for re-vegetation should be indigenous to the area, hardy, fast-growing, nitrogen-fixing, provide high plant cover, be adapted to growing on exposed and disturbed soil (pioneer plants) and should easily be propagated by seed or cuttings.

## 7.8 Visual

### **7.8.1 Issues Related to the Potential Location of the Ash Disposal Facility**

An 8km radius around the Matimba Power Station complex has been provided for identification of potential locations for the proposed ash disposal facility. The options that have been proposed are (refer to Figure 38):

- An extension into the remainder of the Zwartwater property (to the west)
- A new ash disposal facility on the Vooruit , Droogeheuwel, Ganzepan or Appelvlakte properties to the north of the Matimba Power Station

One of the most important potential impacts would be whether the proposed ash disposal facility may create visual exposure to areas that are currently not affected or partly affected. Potentially visually 'sensitive' areas may exist to the south and south-west of the existing ash disposal facility, where hunting activities occur. Thus any extension of the existing ash disposal facility to the west and most importantly the south may be responsible for creating visual impacts for receptors in these areas. The ash disposal facility may be viewed negatively if value is placed in the natural aesthetics of the property on which hunting occurs, as the ash disposal facility may adversely affect the aesthetic context. A similar negative perception may be created if an ash disposal facility were to be visible from the western or northern edge of Onverwacht, although it is expected that receptors in Onverwacht may be less sensitive than those on hunting farms, as less value is likely to be placed on the aesthetics of the surrounds. The sensitivity of receptors in Onverwacht would however depend on the proximity of the ash disposal facility to the viewers and whether the dump was perceived to be associated with other negative factors such as dust creation.

Depending on the proposed location of the ash disposal facility, the degree of visual exposure at receptor locations to the south and south-west of the study area will need to be determined, and the sensitivity to increased visual exposure to the ash disposal facility at these locations will need to be established.

### **7.8.2 Issues Related to the Raising of the Ash Disposal Facility Height**

An option to deal with future ashing needs may be to do this via 'piggy-backing', i.e. raising the height of the existing ash disposal facility by placing future ash on top of it. The raising of the ash disposal facility would make it more visible from a wider area due to its increased height, with an active (white) ashing face being visible. This increased visual exposure may be associated with visual impacts at sensitive receptor locations to the south of the study area. Should piggy-backing be a technically-feasible option that is considered in the EIA phase of the project, the visual impacts of this would need to be considered.



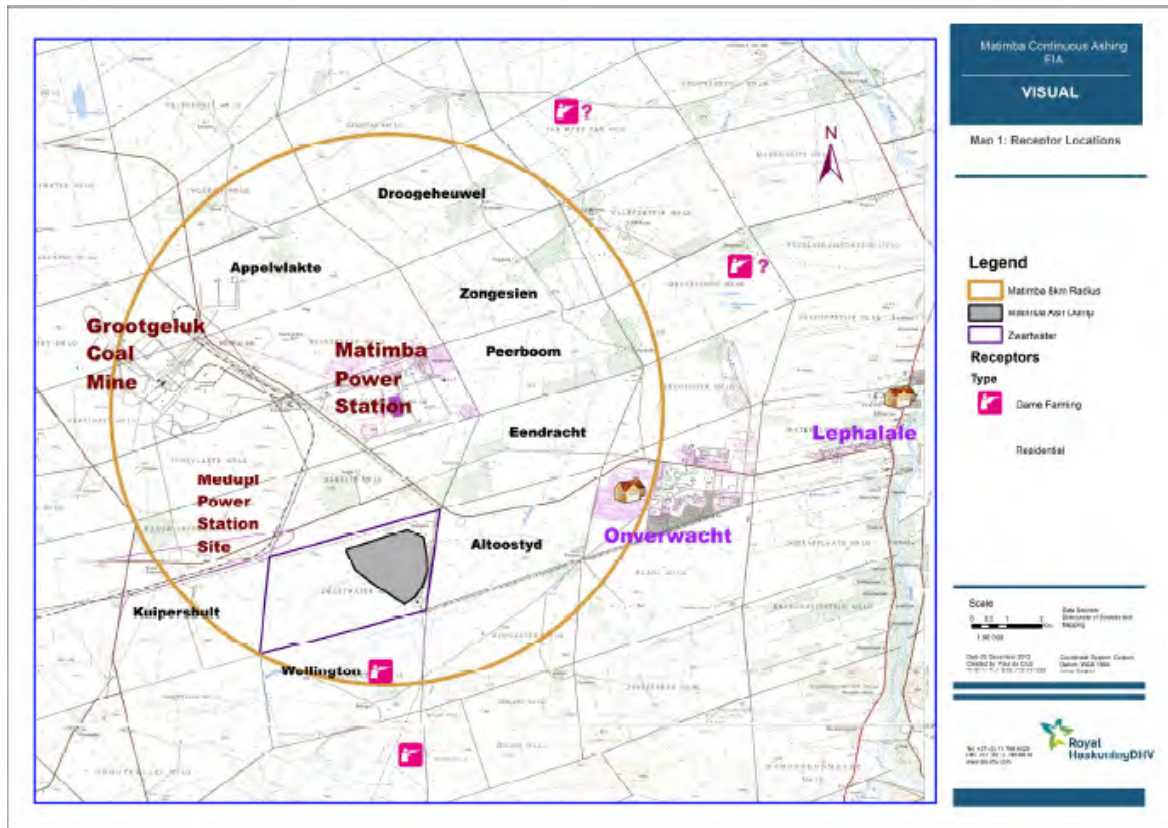


Figure 38: Visual Receptor Locations in the Study Area

## 7.9 Heritage

A Heritage Impact Assessment is focused on two phases of a proposed development: the construction and operation phases. However, from a cultural heritage perspective, this distinction does not apply. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted can be written into the management plan, wherefrom they can be avoided or cared for in the future.

The Stone Age site on the farm Nelsons Kop 464 LQ is viewed as having a high significance on provincial level. It contains engravings and cut marks in a small rock shelter. Such features are linked to the San people's world view and religious practices. Furthermore, the headgear for the original mine exploration found on Eendracht 505LQ, done in the region during the 1960s, is viewed to have a high significance on a provincial level.

Both these sites would in effect disqualify the proposed ash disposal facility from being constructed in their vicinity.

## 7.10 Traffic

The transport component, such as delivery of additional conveyor belts, has a very small impact, if any, and when required it will be of a very short-term. A conveyor system is used to transport ash from the power station and therefore, limited construction plant is required.

The operational traffic also has a very-small, if any, impact as the extent is localised and a conveyor system is used.

#### **7.10.1 Existing Ash Disposal Facility**

- Extension of the existing ash disposal facility will have a very-small impact on the existing road network.
- No substantial additional construction vehicles would be required, if ash disposal was to continue from the existing facility. Additional construction vehicles would be required for activities such as transport of components e.g. lining material
- The existing ash disposal facility's operational traffic will have no impact on the existing road network.

#### **7.10.2 New Ash Disposal Facility**

- The impact on roads and traffic will be local during construction while the new conveyor system is being constructed over or under the existing roads or railway lines.
- A new access road will also have to be provided for the new ash disposal facility if it is on site alternative 2.

## **7.11 Noise**

### **7.11.1 Residual (Baseline) Noise Climate**

In overview, the existing situation with respect to the *noise climate* in the study area was found to be as follows:

- i) The areas relatively far from the main roads, Matimba Power Station and the Medupi Power Station construction activities, are generally very quiet. Most of the area has a typical rural noise climate.
- ii) The main sources of noise in the area are from traffic on the main roads, Matimba Power Station, power station infrastructure remote from the facility (inclusive of the overland conveyor system and the ash disposal facility), Medupi Power Station (still under construction) and Grootegeluk Coal Mine. These noise sources are significant contributors to a degraded noise climate.
- iii) With regard to traffic noise from Nelson Mandela Drive, existing residences in the residential areas of Lephalale (Ellisras) and Onverwacht up to approximately a 500 m offset from the road impacted (night-time conditions). In these areas the noise levels exceed acceptable suburban residential living conditions as specified in SANS 10103. Ideally the ambient noise level should not exceed 50 dBA during the daytime period (06h00 to 22h00) and 40 dBA during the night-time period (22h00 to 06h00).
- iv) Ambient noise levels due to traffic in the areas along Steenbokpan Road (D1675) and Road D2001 (north of the coal mine) are not high.
- v) Noise levels from Matimba Power Station adversely affect the daytime noise climate at any residences within a radius of 3000 m from the facility, based on the rural standards that need to be applied for this area. At night the radius of impact increases to approximately 6500 m. At present the Medupi Power Station is under construction. The predicted noise footprint when the power station is commissioned is estimated to adversely affect the daytime noise climate at any residences in the surrounding area for up to a distance of 4700 m around the facility based on the rural standards that need to be applied for this area. At night the radius of impact increases to approximately 9500 m. There will be cumulative effects of noise from the Matimba and Medupi Power Stations that will enlarge the individual noise footprints of these two sources of noise.
- vi) There are also noise sources from Matimba Power Station equipment at locations remote from the power station as well as other isolated (or infrequent) noise sources such as:

- Coal conveyor belt from the coal mine to the power station and the conveyor belt transporting the ash from Matimba power station to the ash disposal facility.
  - Operations at the existing ash disposal facility that include the disposal and spreading of the ash, and the rehabilitation of the disposal site. The 35 dBA noise contour of the ash disposal facility operations is presently positioned at 3250 m from the disposal facility.
  - The sewage works serving the power station, which is located 3 km to the north of the power station.
- vii) The Grootegeluk coal mine is a major source of noise in the area.
- viii) An intermittent source of noise are the coal haul trains on the railway line from the coal mine to Thabazimbi. There are at present two trains per day.

#### 7.11.2 Predicted Noise Climate (Pre-construction Phase)

Activities during the planning and design phase that normally have possible noise impact implications are those related to field surveys (such as seismic testing, water borehole drilling and geological test borehole drilling for prospecting purposes and/or investigation of founding conditions for large buildings/plant/equipment). As these activities are usually of short duration and take place during the day, they are unlikely to cause any major noise disturbance or nuisance in most adjacent areas.

#### 7.11.3 Predicted Noise Climate (Construction Phase)

The noise impacts from construction activities are predicted to be as follows:

- i) Source noise levels from many of the construction activities will be high. Noise levels from all work areas will vary constantly and in many instances significantly over short periods during any day working period.
- ii) Exact daytime period and night-time period continuous equivalent sound pressure levels are not possible to calculate with certainty at this stage as the final construction site layout, work programme for the various components, work modus operandi and type of equipment have not been finalised. Working on a worst case scenario basis, it is estimated that the ambient noise level from general construction activities could negatively affect noise sensitive sites within a distance of 1400metres of the construction site. Night-time construction could have a significant impact on noise sensitive sites within a radius of 3000 metres of the construction site.
- iii) There are likely to be some noise nuisance effects during the day from intermittent loud noises, on people living in the area. If there is any night-time construction, fairly significant impacts will be experienced.

#### 7.11.4 Predicted Noise Climate (Operational Phase)

It is predicted that the noise from the ashing operations at the proposed ash disposal facility could be of the following order at the given offsets from the source. Where relevant, cumulative effects of noise sources will be addressed.

**Table 24: Predicted Noise during Operational Phase**

Offset Distance (m)	Noise from Ashing Operations (dBA)
500	53.9
1000	46.9
2000	39.3
3000	34.4

## 7.12 Waste

The potential waste streams for the proposed development include general and hazardous waste.

### **7.12.1 General Waste**

Workers will generate general waste such as food wastes, packaging and wastepaper. It is proposed that the waste streams generated be managed in line with Matimba Power Station's waste management procedures.

### **7.12.2 Waste Material from Construction of Surface Structures/Site Formation**

Waste material such as topsoil, vegetation, and boulders will be generated. This waste should be sorted and reused for instance; excavated topsoil and boulders could be re-used in landscaping works and vegetation can be utilized to produce compost for later use during landscaping.

### **7.12.3 Construction and Demolition Waste**

These materials should be segregated and stored in segregated waste containers so as to encourage the re-use or recycling of materials and their proper disposal.

### **7.12.4 Fuels, oils and other wastes**

This waste stream must be managed in line with Matimba Power Station's waste management procedures.

### **7.12.5 Ash**

Ash that is produced from the Matimba power station will be disposed off at the proposed ash disposal facility.

## 8 CONCLUSIONS AND RECOMMENDATIONS

The Environmental Scoping Study (ESS) for the proposed ash disposal facility for the Matimba Power Station, has been undertaken in accordance with the Environmental Impact Assessment Regulations (2010) published in Government Notices R. 543 of 18 June 2010 read with Section 44, of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

In line with Regulation 28 (Part 3) of the EIA Regulations, the ESS aimed to identify and provide:

- A description of the proposed activity
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, and economic aspects of the environment may be affected by the proposed activity
- The identification of all legislation and guidelines applicable to the development
- A description of environmental issues and potential impacts, including cumulative impacts, that have been identified
- Details of the public participation process conducted to date
- A Plan of Study for Environmental Impact Assessment (refer to Chapter 9) including the methodology that will be adopted in assessing the potential impacts that have been identified, including specialist studies or specialised processes that will be undertaken.

Based on the Environmental Scoping Study (ESS) undertaken, it can be concluded that there are no fatal flaws associated with the project. Potential environmental impacts have been highlighted and will be further investigated in the EIA phase. The methodology that will be used for assessment of potential significant impacts is contained in Chapter 9 (Plan of Study for EIA).

Table 25 below outlines the potential impacts identified during the ESS phase and the recommendations for the EIA phase study.

**Table 25: Potential Impacts Identified within the ESS and Recommendations for the EIA Phase**

Discipline	Potential Impacts	Recommendations
<b>Soils and Agriculture Potential</b>	<ul style="list-style-type: none"> <li>Physical soil disturbance due to construction and disposal activities: Direct impacts are associated with the soils that will be covered during the construction of the proposed ash disposal facility. Soils could also be contaminated due to spillage, leakage, incorrect storage and handling of chemicals, oils, and fuel during construction and operation.</li> <li>Indirect impacts could arise in the form of soil erosion, dust generation and degradation if storm water management is not planned and managed properly.</li> <li>Impacts on current land use due to construction activities: Direct impacts are associated with the soils that will be removed during the construction of the proposed ash disposal facility. Indirect impacts could arise in the form of soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites.</li> </ul>	<p>The overall impacts of the proposed continuous ash disposal facility on soils and agriculture is considered to be low due to the low agricultural potential of the general area which is as a result of very sandy soils.</p> <p>Due to the relatively low rainfall, impacts on the soils such as dust generation are considered more problematic and will have to be addressed in more detail in the EIA process. Soil erosion is also considered to be of low risk due to the level nature of the terrain.</p> <p>A detailed soils and agricultural potential study will be undertaken as part of the EIA phase level investigation.</p>
<b>Biodiversity</b>	<p>The following impacts/issues could affect the biodiversity of the study area adversely:</p> <ul style="list-style-type: none"> <li>Direct impacts on threatened flora species.</li> <li>Direct impacts on protected flora species.</li> <li>Direct impacts on threatened faunal taxa.</li> <li>Direct impacts on common fauna species/faunal assemblages (including migration patterns, corridors, etc).</li> <li>Human - Animal conflicts.</li> <li>Loss or degradation of natural vegetation/ Sensitive habitat.</li> <li>Indirect Impacts on Surrounding Habitat / Species and Ecosystem Functioning.</li> </ul> <p>The above impacts will occur mainly during the construction of the ash disposal facility.</p> <p>Impacts of a cumulative nature include:</p> <ul style="list-style-type: none"> <li>Impacts on SA's conservation obligations and targets.</li> <li>Increase in local and regional fragmentation/ isolation of habitat.</li> <li>Increase in environmental degradation, pollution (air, soils, surface water).</li> </ul>	<p>A detailed assessment of the study area will be undertaken in the EIA phase in order to adequately assess the potential impacts on biodiversity as a result of the proposed ash disposal facility and will recommend appropriate mitigation measures.</p>
<b>Surface Water</b>	<p>The Sandloop River is the major natural surface water resource that was identified in the study area during this Scoping Study.</p> <ul style="list-style-type: none"> <li>Direct Impacts related to loss of Habitat</li> </ul> <p>The proposed ash disposal facility would have a highly significant impact on surface water resources if surface water features were to fall within the area that would be occupied by the ash disposal facility. This would lead to complete loss of riparian and aquatic habitat within the affected</p>	<p>A detailed surface water study specifically on the drainage lines in the selected site alternatives will be undertaken. The aim will be to confirm if they are watercourses as defined by the National Water Act (No 36 of 1998) and to delineate them in terms of their riparian zone.</p> <p>The exact groundwater flow dynamics of the</p>

Discipline	Potential Impacts	Recommendations
	<p>reach of the surface water feature. In the case of linear drainage features, the surface and sub-surface hydrology of these features would be completely altered, as the ash disposal facility would form a physical barrier to the movement of water along the feature. This would have 'knock-on' downstream impacts on the watercourse as these stretches would be deprived of water input. Physical habitat for the biota within the riparian and aquatic components of the feature would be lost, and this would lead to a significant localised ecological impact and a significant adverse impact on the resource quality. Ecosystem processes, particularly those relating to linear linkages along watercourses and drainage lines would be severely disrupted.</p> <ul style="list-style-type: none"> <li>• Indirect Pollution Impacts</li> </ul> <p>Indirect pollution impacts would relate to the entry of ash or associated chemical pollutants into a surface water feature such as Sandloop River through seepage or by being washed into the surface water feature by runoff or other agents of mobility. Water that has interacted with ash from the disposal facility is typically high in sodium and sulphates that could act as pollutants if transported into nearby natural drainage systems.</p> <p>From the proposed ash disposal facility, seepage could cause water from the ash disposal facility to move horizontally above the surface of the impermeable Swartrant Sandstone southwards towards the Sandloop River or other drainage lines identified. If this seepage water were to surface or mix with natural sub-surface flow within the river, this could potentially cause pollution.</p>	<p>area surrounding the proposed new ash disposal facility will need to be investigated as part of the hydrogeological study being undertaken as part of this EIA. The information gathered by this investigation will need to be assessed and incorporated into the EIA-phase surface water study.</p>
<p><b>Visual Impact</b></p>	<p>An 8 km radius around the Matimba Power Station complex has been provided for identification of potential locations for the proposed ash disposal facility. The options that have been proposed are:</p> <ul style="list-style-type: none"> <li>✓ An extension into the remainder of the Zwartwater property (to the west) and</li> <li>✓ A new ash disposal facility on the Vooruit, Droogeheuwel, Ganzepan or Appelvlakte properties to the north of the Matimba Power Station.</li> </ul> <p>One of the most important potential impacts would be whether the proposed ash disposal facility may create visual exposure to areas that are currently not affected or partly affected. Potentially visually 'sensitive' areas may exist to the south and south-west of the existing ash disposal facility, where hunting activities occur. Thus any extension of the existing ash disposal facility to the west and most importantly the south may be responsible for creating visual impacts for receptors in these areas. The ash disposal facility may be viewed</p>	<p>The visual impacts associated with the proposed ash disposal facility will be assessed in further detail during the EIA assessment phase.</p>

Discipline	Potential Impacts	Recommendations
	<p>negatively if value is placed in the natural aesthetics of the property on which hunting occurs, as the ash disposal facility may adversely affect the aesthetic context. A similar negative perception may be created if an ash disposal facility were to be visible from the western or northern edge of Onverwacht, although it is expected that receptors in Onverwacht may be less sensitive than those on hunting farms, as less value is likely to be placed on the aesthetics of the surrounds. The sensitivity of receptors in Onverwacht would however depend on the proximity of the ash disposal facility to the viewers and whether the dump was perceived to be associated with other negative factors such as dust creation.</p> <p>Depending on the proposed location of the ash disposal facility, the degree of visual exposure at receptor locations to the south and south-west of the study area will need to be determined, and the sensitivity to increased visual exposure to the ash disposal facility at these locations will need to be established.</p>	
<p><b>Air Quality</b></p>	<ul style="list-style-type: none"> <li>• Construction Phase The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction operations at the site: <ul style="list-style-type: none"> <li>✓ Ash transport</li> <li>✓ Ash disposal site preparation;</li> <li>✓ Conveyor belts</li> <li>✓ Roads</li> </ul> </li> </ul> <p>The following components of the environment may be impacted upon during the construction phase:</p> <ul style="list-style-type: none"> <li>✓ Ambient air quality;</li> <li>✓ Local residents and neighbouring communities;</li> <li>✓ Employees;</li> <li>✓ The aesthetic environment; and</li> <li>✓ Possibly fauna and flora</li> </ul> <ul style="list-style-type: none"> <li>• Operational Phase Potential air quality impacts could result due to the proposed operations of the ash disposal facility. Details regarding the source characteristics will be obtained from site layout plans and process specific information provided and a questionnaire filled in by the client. Once all site layouts and final geotechnical works are complete, site specific information should then be sufficient for dispersion modelling and will then be included in the Environmental Impact Assessment Report.</li> </ul> <ul style="list-style-type: none"> <li>• Decommissioning Phase The following activities are associated with the decommissioning phase: <ul style="list-style-type: none"> <li>✓ Existing buildings and structures are</li> </ul> </li> </ul>	<p>A detailed assessment will be undertaken in the EIA phase in order to adequately assess the potential impacts on air quality as a result of the proposed ash disposal facility and appropriate mitigation measures will be recommended.</p>



Discipline	Potential Impacts	Recommendations
	<p>demolished, rubble removed and the area levelled.</p> <ul style="list-style-type: none"> <li>✓ Remaining exposed excavated areas are filled and levelled.</li> <li>✓ Land and permanent waste piles are prepared for re-vegetation.</li> </ul> <p>Possible sources of fugitive dust emissions during the closure and post-closure phase include:</p> <ul style="list-style-type: none"> <li>✓ Smoothing of stockpiles by bulldozers.</li> <li>✓ Grading of sites.</li> <li>✓ Transport and dumping of overburden for filling.</li> <li>✓ Infrastructure demolition.</li> <li>✓ Infrastructure rubble piles.</li> <li>✓ Transport and dumping of building rubble.</li> <li>✓ Transport and dumping of topsoil.</li> <li>✓ Preparation of soil for revegetation – ploughing and addition of fertiliser, compost etc.</li> </ul>	
<b>Geohydrology / Hydrogeology</b>	<p>The possible sources of contamination or infrastructure that may impact on the groundwater resources include:</p> <ul style="list-style-type: none"> <li>• Ash water return dams</li> <li>• Fuel, oil used in the running / maintenance of equipment.</li> <li>• Ash that is disposed of at the facility.</li> <li>• Matimba Power Station operations.</li> <li>• Existing ash disposal facility.</li> <li>• Grootegeluk mining operations.</li> </ul>	<p>A detailed geo-hydrological assessment will be undertaken during the EIA phase in order to adequately assess the potential impacts on ground water as a result of the proposed ash disposal facility and appropriate mitigation measures will be recommended.</p>
<b>Hydrology</b>	<p>The potential impacts on hydrology include:</p> <ul style="list-style-type: none"> <li>• Deterioration of the Sandloop River water quality due to seepage or overland storm water flows.</li> <li>• Minimal stream flow reductions could potentially occur.</li> <li>• Spillages from substances such as oil could be transported to the Sandloop River causing pollution.</li> <li>• Disturbance of the soil surface could cause increased run off leading to transport of contaminants to downstream users.</li> </ul>	<p>A detailed site assessment will be undertaken during the EIA phase in order to obtain a better understanding of the site alternatives and the general environment, conduct quality sampling, and assess the potential impacts identified.</p>
<b>Social</b>	<ul style="list-style-type: none"> <li>• Impact on Health</li> </ul> <p>The primary concern from a social impact perspective of the proposed activity is the potential impact of airborne ash, known as coal fly ash (CFA) on neighbouring communities. Coal fly ash consists of particles formed by mineral transformation in high-temperature combustion processes. CFA is a primary particle emitted, along with soot as a solid from the power plant stack. Exposure to CFA is a health concern because of human exposure to particulate matter associated with increased respiratory and cardiac disease.</p>	<p>During the EIA phase, a Social Impact Assessment (SIA) study will be undertaken. The potential impacts will be assessed and mitigation measures will be proposed to enhance the positive impacts and reduce the significance of the negative impacts.</p>

Discipline	Potential Impacts	Recommendations
	<p>Also worth noting, is the potential for accidents at the ash disposal facility and surrounding areas as a result of dust storms which reduce visibility especially in the windy season. This is uncommon however, the potential must be investigated. Weather patterns will show conditions for the development of dust storms, with the presence of fly ash being a possible accelerant to the storms.</p> <ul style="list-style-type: none"> <li>• Impact on Employment Opportunities Job creation is a positive spin-off from any development; the true effects of employment will be felt at household level. However, the labour required for the proposed development is likely to be minimal because ashing is not labour intensive. Thus the impact on household economics would also be minimal and of a short (temporary) nature.</li> <li>• Impact on Land Use The proposed development would have effects on land use in the area. There is evidence that residents utilise natural resources particularly in the northern part of the study area where there is a game reserve. Additionally, the building of further residential (and possibly small scale business outlets in the future within the Marapong and Lephalale communities) may be impacted by airborne ash, unless proper dust prevention measures are taken.</li> </ul>	
<b>Noise Impact</b>	<p>Potential noise impacts consist of the following:</p> <ul style="list-style-type: none"> <li>• Impacts on the residual (existing) noise climate.</li> <li>• Predicted Noise Climate (Pre-construction Phase).</li> <li>• Predicted Noise Climate (Construction Phase).</li> <li>• Predicted Noise Climate (Operational Phase).</li> </ul>	<p>During the EIA phase, operation of the proposed ash disposal facility will be modelled. The projected operational noise climate will then be compared with the baseline noise climate in order to determine the nature, magnitude, extent and implications of the noise impact of the proposed ash disposal facility.</p>
<b>Heritage</b>	<p>The Stone Age site on the farm Nelsons Kop 464 LQ is viewed as having a high significance on provincial level. It contains engravings and cut marks in a small rock shelter. Such features are linked to the San people's world view and religious practices. Furthermore, the headgear for the original mine exploration found on Eendracht 505LQ, done in the region during the 1960s, is viewed to have a high significance on a provincial level.</p> <p>Both these sites would in effect disqualify the proposed ash disposal facility from being constructed in their vicinity.</p>	<p>A full phase 1 archaeological survey of the two alternative sites will be conducted in accordance with the requirements of Section 38 (3) of the National Heritage Resources Act (No. 25 of 1999) in the EIA phase.</p>
<b>Traffic</b>	<p>Existing Ash Disposal Facility</p> <ul style="list-style-type: none"> <li>• Extension of the existing ash disposal facility will have a very small impact on the existing road network.</li> <li>• No substantial additional construction vehicles would be required, if ash disposal was to</li> </ul>	<p>A detailed traffic and transport engineering study will be undertaken during the EIA phase in order to adequately assess the potential impacts on traffic as a result of the proposed ash disposal facility and recommend appropriate mitigation measures.</p>

Discipline	Potential Impacts	Recommendations
	<p>continue from the existing facility. Additional construction vehicles would be required for activities such as transport of components e.g. lining material.</p> <ul style="list-style-type: none"> <li>The existing ash disposal facility's operational traffic will have no impact on the existing road network.</li> </ul> <p>New Ash Disposal Facility</p> <ul style="list-style-type: none"> <li>The impact on roads and traffic will be localised during construction while the new conveyor system is being constructed over or under the existing roads or railway lines.</li> <li>A new access road will also have to be provided for the new ash disposal facility if it's on site alternative 2.</li> </ul>	

## 9 PLAN OF STUDY FOR EIA

Potential environmental impacts (biophysical and social) associated with the proposed ash disposal facility for the Matimba Power Station, have been identified in the Environmental Scoping Study (ESS). No fatal flaws or highly significant impacts have been identified to date. All potentially significant and cumulative impacts will be further investigated and assessed within the Environmental Impact Assessment (EIA) phase of the project. Mitigation measures will be contained in the Environmental Management Programme (EMPr) to be compiled during the EIA phase. Mitigation measures recommended in the ESS will also be included in the EMPr.

The EIA phase will aim to adequately assess and address all potentially significant environmental issues in order to provide the Department of Environmental Affairs (DEA) with sufficient information to make an informed decision regarding the proposed project.

The following points below outline the proposed approach to undertaking the EIA phase of the project. It is believed that the proposed approach will adequately fulfil the competent authority's (DEA's) requirements, the requirements of the EIA Regulations (2010) and the objectives of environmental best practice, so as to ensure transparency and to allow an informed decision to be made.

### 9.1 Authority Consultation

Ongoing consultation with DEA, DWA, the Waterberg District Municipality, Lephalale Local Municipality, Ward Councillors, SAHRA and all other authorities identified during the Environmental Scoping Study (ESS) phase of the project (and further ones that may be identified during the EIA phase) will continue throughout the duration of the project. Authority consultation is therefore, seen as a continuous process that takes place until completion of the environmental investigations.

### 9.2 Aims of the EIA Study

The EIA will aim to achieve the following:

- to supplement, where necessary, the assessment of the social and biophysical environments affected by the development during the Scoping study;
- to assess impacts on the study area in terms of environmental criteria;
- to identify and recommend appropriate mitigation measures for potentially significant environmental impacts;
- to compile an Environmental Management Programme (EMPr) for the inclusion of proposed mitigation measures; and
- to undertake a fully inclusive public participation process to ensure that I&AP issues and concerns are recorded and addressed.

### 9.3 Specialist Studies

The following specialist studies and specialists are proposed to be undertaken in the EIA Phase:

**Table 26: Specialist studies to be undertaken in the EIA phase**

Specialist Field	Specialist and Organisation
Soils and Agricultural Potential	<i>Dr Johan van der Waals – Terra Soil Science</i>
Biodiversity Assessment	<i>Riaan Robbeson – Bathusi Environmental Consulting Dewald Kamffer - Faunal Specialists Incorporated</i>
Surface Water Assessment	<i>Paul da Cruz – Royal HaskoningDHV</i>
Visual Impact Assessment	<i>Paul da Cruz – Royal HaskoningDHV</i>

Specialist Field	Specialist and Organisation
Air Quality Impact Assessment	Stuart Thompson – Royal HaskoningDHV
Heritage Assessment	Johnny van Schalkwyk -Private
Geohydrology Assessment	Claudia Brites - GCS Water & Environmental Consultants
Hydrology Assessment	Karen King - GCS Water & Environmental Consultants
Social Impact Assessment	Kim Moonsamy - Royal HaskoningDHV
Traffic Impact Assessment	Ivan Reutener - Royal HaskoningDHV
Noise Impact Assessment	Derek Cosijn - Jongens Keet Associates
Geology and Geotechnical	Sodhie Naicker – Kai Batla Mineral Industry Consultants

The Terms of Reference for each of the specialist studies for the EIA phase is provided in Table 27 below. As a critical step in the EIA process, it is important that the public has the opportunity to comment on, and the authorities approve of, the proposed approach to the EIA Phase.

Commenting on the Plan of Study (PoS) for EIA ensures that the proposed approach, including the scope of work for the specialists, is informed by public and authority feedback. This is in order to ensure that the work produced addresses the issues of concern at the requisite level of confidence. A robust basis for informed debate and decision making is thus provided.

Key outcomes of the specialist studies would be information which will allow I&APs to engage in informed debate on the implications of the proposed project and will allow Eskom to make an informed decision on the location of the ash disposal facility. Eskom will also gain an understanding of the range and benefits of implementing possible mitigation measures.

**Table 27: Terms of Reference for Specialist Studies to be conducted in the EIA Study**

Study	Terms of Reference
<b>Soils and Agriculture Potential</b> <i>Dr Johan van der Waals – Terra Soil Science</i>	<p>A detailed site visit will have to be conducted as part of the EIA phase level investigation and the following parameters will be investigated:</p> <ul style="list-style-type: none"> <li>• Soil distribution (classification) on the proposed alternative sites;</li> <li>• Extent of degradation due to current land use (such as overgrazing);</li> <li>• Erosion status and erodibility of the soils on the site; and</li> <li>• Measures to mitigate identified impacts and manage future impacts associated with the development.</li> </ul>
<b>Biodiversity Assessment</b> <i>Riaan Robbeson – Bathusi Environmental Consulting</i> <i>Dewald Kamffer - Faunal Specialists Incorporated</i>	<p>In order to compile detailed knowledge of the biodiversity of the study area, the following aspects will be included as part of the EIA investigation.</p> <p><b>Floral Assessment</b></p> <ul style="list-style-type: none"> <li>• <b>Sampling Approach</b></li> </ul> <p>The number of sample plots to be distributed in a given area depends on various factors, such as the scale of the classification, environmental heterogeneity and the accuracy required for the classification. Stratification of sample plots will be based on visual observations made during the initial site investigation as well as aerial imagery. The Zurich-Montpellier approach of phytosociology (Braun-Blanquet, 1964) will be followed; this is a standardised and widely used sampling technique for general vegetation surveying in South Africa. During the surveys, all plant species in the sample plots and the cover and/or abundance of each species will be estimated according to the Braun-Blanquet cover abundance scale:</p>

Study	Terms of Reference
	<p>In addition, a relevant selection of the following biophysical attributes will be recorded within each relevè<sup>12</sup>:</p> <ul style="list-style-type: none"> <li>• Altitude- and longitude positions for each relevè - obtained from a GPS;</li> <li>• Soil characteristics, including colour, clay content, etc;</li> <li>• Topography (crests, scarps, midslopes, footslopes, valley bottoms, floodplains or drainage lines);</li> <li>• Altitude, slope and aspect;</li> <li>• Rockiness, estimated as a percentage;</li> <li>• Rock size; and</li> <li>• General observations (including the extent of erosion, utilisation, disturbances of the vegetation management practices, etc).</li> </ul> <p>In addition to species captured within the sample plots, general observations will be made in order to compile a comprehensive species list that will include taxa that, because of low abundance levels, are unlikely to be captured within the sample areas. Particular reference is made to Red Data plants, which normally do not occur at great densities.</p> <ul style="list-style-type: none"> <li>• <b>Data Processing</b></li> </ul> <p>The combined floristic and faunal data sets will be subjected to the Two- Way Indicator Species Analysis technique (TWINSPAN) and subsequently refined by Braun-Blanquet procedures. TWINSPAN will be applied to derive a first approximation of the vegetation units. These classifications will be further refined by the application of Braun-Blanquet procedures to determine the plant communities. A phytosociological table showing the vegetation lines will be used to compile a synoptic table of the datasets. A synoptic table summarizes and confirms the vegetation types/ habitat types and variations. Relevant descriptions will follow from the data analysis, based on the presence/ absence and abundance of taxa.</p> <p><b>Faunal Assessment</b></p> <p>It is recommended that the following EIA study methods be implemented to gain an ecological understanding of the study area as well as the biodiversity contribution of the study area within a regional and provincial context.</p> <ul style="list-style-type: none"> <li>• <b>Invertebrates</b></li> </ul> <p>Invertebrates are by far the most important animals present anywhere. They are very useful bio-indicators and include meaningful surrogates, flagships and diversity indicators. The invertebrate studies will be twofold:</p> <ul style="list-style-type: none"> <li>• Firstly, sweep samples and pitfall samples of invertebrates would be used to compare sample plots in terms of species richness (number of species) and species diversity (relative abundances between species groups). Species recorded in these samples will also be included in the species inventory;</li> <li>• Secondly, a species inventory of the study area/s will be compiled using above-mentioned methods as well as active searches for scorpions (under rocks and using UV-lights), for butterflies (using a hand-held net) and beetles (under rocks, bark hand-netting etc.).</li> </ul> <ul style="list-style-type: none"> <li>• <b>Herpetofauna</b></li> </ul> <p>Frogs will be sampled using species-specific calls of males as identification; also, active searches for active adults during early evenings. Snakes, lizards and other reptiles will be sampled by active searches in likely habitats (under rocks, in inactive termitaria etc.). Extensive use will also be made of local specialists.</p> <ul style="list-style-type: none"> <li>• <b>Birds</b></li> </ul> <p>Assessing avifaunal diversity of an area includes three components:</p> <ul style="list-style-type: none"> <li>• Visual sightings;</li> <li>• Audio observations; and</li> </ul>

<sup>12</sup> Relevè is a method of sampling vegetation.

Study	Terms of Reference
	<ul style="list-style-type: none"> <li>• Habitat assessments.</li> </ul> <p>A large number of bird species are highly visible and easily identifiable using visual observations. Binoculars are used to assist the observer in identifying smaller and more cryptic species. Many bird species are cryptically coloured and can only be identified using sound; calls of most cryptic bird species are species-specific and very useful in compiling a species inventory list of the area under investigation.</p> <p>A characteristic of all biodiversity assessments is the limiting factor of time and budget. Ideally, various field assessments during all seasons of the year are needed to start to create an “avifauna image” of the study area that supports the reality of bird communities in the area. Since this is never accomplished in reality, habitat assessments are used to create a “model” of the bird communities likely to be found in the area investigated. Fortunately, data is available on the birds of Southern Africa; distribution records, habitat requirements etc. By assessing the available habitat within the study area (with focus on habitat characteristics available and diversity and quality of habitats present), all bird species (including Red Data birds) are assessed in terms of likelihood of occurring within the study area.</p> <p>The final stage of the avifaunal study is using the image created of the avifaunal communities of the study area in assessing the impacts of the proposed project on the avifauna of the study area.</p> <ul style="list-style-type: none"> <li>• <b>Mammals</b></li> </ul> <p>Visual sightings as well as ecological indicators such as tracks, dung, calls and diggings will be used to compile a species inventory of the mammals of the study area. Additionally, small mammal live traps will be used to sample for rodents and insectivores.</p> <ul style="list-style-type: none"> <li>• <b>Ecology</b></li> </ul> <p>Species inventory lists compiled and indications of species richness and species diversity obtained using above-mentioned methods will be used to interpret the relative ecological status of the study area/s and to compare areas and variations in faunal habitats present. These comparisons are done in collaboration with the vegetation specialist in order to gain a comprehensive ecological understanding of the study area and the potential impacts on the study area/s.</p>
<p><b>Surface Water Assessment</b>  <i>Paul da Cruz – Royal HaskoningDHV</i></p>	<p>The EIA-phase surface water study will assess in more detail the nature of the drainage lines on the two site alternatives selected. The aim will be to confirm if they are watercourses as defined by the National Water Act and to delineate them in terms of their riparian zone. If hydric soils are found to occur, the extent of these features will be delineated in the field utilising the Department of Water Affairs’ guideline for the delineation of wetland areas (DWAF, 2005). This guideline will also form the basis for the delineation of the edge of the riparian zone of the surface water features where a riparian zone is present. A surface water and riparian zone shapefile will be created.</p> <p>The impacts of the proposed ash disposal facility, will be more fully investigated. This will include the assessment of the likely impacts associated with the ‘covering’ and thus destruction of part of any surface water feature by the ash disposal facility (if relevant), as well as an assessment of the impacts of water runoff and seepage from the ash disposal facility on nearby surface water features..</p> <p>Based on the identification of impacts, a list of mitigation or remediation measures will be specified. Lastly the impacts of the proposed project on surface water features will be rated in terms of the EIA rating matrix.</p>
<p><b>Visual Impact Assessment</b>  <i>Paul da Cruz – Royal HaskoningDHV</i></p>	<p>The visual impacts associated with the proposed ash disposal facility will be assessed in further detail during the EIA assessment phase to include the assessment of the visual</p>

Study	Terms of Reference
	<p>sensitivity of hunting areas to the south and south-west of the study area, and the degree to which the proposed ash disposal facility would impact on these areas.</p>
<p><b>Air Quality Impact Assessment</b>  <i>Stuart Thompson – Royal HaskoningDHV</i></p>	<p>In terms of this Air Quality Scoping Assessment, the following sources of potential air pollution have been identified:</p> <ul style="list-style-type: none"> <li>• Matimba Power Station</li> <li>• Matimba ash disposal facility</li> <li>• Medupi Power Station (currently under construction)</li> <li>• Veld fires</li> <li>• Domestic fuel burning at the surrounding township</li> <li>• Vehicle entrainment</li> <li>• Agriculture</li> <li>• Mining Operations (Grootegeluk Colliery);</li> </ul> <p>The emissions inventory will need to be developed to determine the emissions generated from each source. This is likely to be undertaken using the US-EPA AP42 emission factors. These emission factors will be calculated based on standard operating conditions for various industries, and activities, and are used as an accepted alternative if no site specific or monitored data are available. The inventory will be developed based on the existing ash disposal facility and Matimba power station operations. Road emissions will be calculated through traffic counts, along with other potential sources, identified during the EIA phase.</p> <p>In order to provide a better indication of the extent of the impacts expected from the proposed construction and operational phases of this development, dispersion simulations will need to be undertaken in the Environmental Impact phase of the EIA process. This will however, only be able to take place once more detail is available regarding the nature of each source type and their respective emission rates.</p> <p>Once these impacts have been quantified, appropriate management measures can be suggested to best mitigate the predicted impacts. These modelled results will similarly allow for the assessment of compliance to local and International Standards.</p>
<p><b>Geohydrology Assessment</b>  <i>Claudia Brites - GCS Water &amp; Environmental Consultants</i></p>	<p>The scoping phase study did not entail detailed intrusive investigations at the site and therefore the following is recommended to form part of the EIA study.</p> <ul style="list-style-type: none"> <li>• It is recommended that detailed ground geophysical investigations be conducted during the EIA phase in order to determine the presence and orientation of linear structures below the alternative sites selected.</li> <li>• Drilling and aquifer testing of monitoring boreholes and site characterisation boreholes is also recommended during the EIA phase. The exact locations of the boreholes will be determined upon completion of the geophysical surveys.</li> <li>• The geophysical traverses will be conducted both upgradient and downgradient of the proposed ash disposal facility, in addition to this a grid will be carried out over the footprint of the proposed ash disposal facility in order to delineate any structures intersecting the ash disposal facility.</li> <li>• It is recommended that the detailed geotechnical study be made available upon completion, in order to carry out an assessment of the unsaturated zone as part of the EIA phase.</li> </ul>
<p><b>Hydrology Assessment</b>  <i>Karen King - GCS Water &amp; Environmental Consultants</i></p>	<p>The following tasks will be undertaken during the EIA phase in order to successfully complete the hydrological study:</p>



Study	Terms of Reference
	<ul style="list-style-type: none"> <li>• Site visit including;               <ul style="list-style-type: none"> <li>✓ Quality sampling;</li> <li>✓ Site evaluation;</li> <li>✓ Flood line assessment (basic site evaluation of river bed and flood plain characteristics);</li> </ul> </li> <li>• Catchment delineation;</li> <li>• Evaluation of catchment characteristics and properties;</li> <li>• Rainfall and Mean Annual Precipitation (MAP) analyses;</li> <li>• Evaluation of chemical properties from lab results of quality samples;</li> <li>• Average flow calculation;</li> <li>• Peak flow calculation;</li> <li>• Flood line modelling (only on specific sections where necessary and applicable (where site area is in close proximity to water features) using HEC-RAS);</li> <li>• Downstream user evaluation;</li> <li>• Drawing of a Process Flow Diagram (PFD) for the W&amp;SB;</li> <li>• Volume analyses for Water and Salt Balance (W&amp;SB);</li> <li>• Salt load determination and evaluation for the W&amp;SB;</li> <li>• Delineation of clean and dirty water areas for conceptual Storm Water Management Plan (SWMP);</li> <li>• Placing of infrastructure to ensure separation of clean and dirty water areas;</li> <li>• Conceptual design of proposed infrastructure;</li> <li>• Propose a monitoring plan;</li> <li>• Identify potential impacts;</li> <li>• Propose mitigation measures; and</li> <li>• Communicate findings.</li> </ul>
<p><b>Social Impact Assessment</b>  <b>Kim Moonsamy – Royal HaskoningDHV</b></p>	<p>During the EIA phase, a Social Impact Assessment (SIA) study will be undertaken. The SIA will provide a baseline description of the study area, specifically focussing on the communities living and working in close proximity to the proposed development. The potential impacts of the proposed ash disposal facility on the social environment will be identified and assessed in terms of an agreed assessment methodology. Mitigation measures will be proposed to enhance the positive impacts and reduce the significance of the negative impacts.</p> <p>In order to deliver the SIA, the following activities are proposed:</p> <p><b>Phase One – Baseline Development</b></p> <ul style="list-style-type: none"> <li>• Confirmation of study area and affected stakeholders (with the project team and relevant public participation team);</li> <li>• Review of available secondary data and gap analysis; and</li> <li>• Prepare a social and economic baseline description of the potentially impacted areas.</li> </ul> <p><b>Phase Two – Determination of Impact, Mitigation and Management Measures</b></p> <p>Utilising the data encompassed within the social baseline, the following tasks will be undertaken:</p> <ul style="list-style-type: none"> <li>• Conduct focus group meetings with sensitive stakeholders as necessary and if available (landowners and other potentially directly affected people);</li> <li>• Assess the data collected during the public participation exercises;</li> <li>• <i>Impact identification and assessment.</i> Following the data collection activities, the social specialist will identify the impacts that are associated with the construction and operation of the proposed ash disposal facility. The identification of potential positive and negative impacts will be informed by all the data included within the Baseline description (which accounts for all data gathering). The findings of the other specialist impact assessment studies will be reviewed and used to inform the impact assessment component of the SIA; and</li> <li>• <i>Identification of management and mitigation measures.</i> Management and mitigation measures to address the identified impacts will be recommended and</li> </ul>

Study	Terms of Reference
	<p>drafted. These measures will be formulated to maximise the positive impacts and reduce the extent of the negative impacts.</p>
<p><b>Noise Impact Assessment</b> <i>Derek Cosijn - Jongens Keet Associates</i></p>	<p>The noise investigation is being undertaken in order to enable a comprehensive appreciation of the potential noise impact of the proposed ash disposal facility. Operations will be modelled in the EIA phase. The projected operational noise climate will then be compared with the baseline noise climate in order to determine the nature, magnitude, extent and implications of the noise impact of the proposed ash disposal facility.</p>
<p><b>Heritage Assessment</b> <i>Johnny van Schalkwyk –Private</i></p>	<p>A full phase 1 archaeological survey of the two alternative sites will be conducted in accordance with the requirements of Section 38 (3) of the National Heritage Resources Act (No. 25 of 1999). Site-specific, detailed management and mitigation measures will furthermore be compiled for inclusion in the Environmental Management Programme (EMPr). The report will provide a map of the identified archaeological artefacts as well as a report detailing the findings of the study, and mitigation of any impacts.</p>
<p><b>Traffic Impact Assessment</b> <i>Ivan Reutener - Royal HaskoningDHV</i></p>	<p>The following Traffic and Transport Engineering aspects will form part of the EIA phase study on the two proposed alternative sites:</p> <ul style="list-style-type: none"> <li>• A site visit to review possible access positions and existing road and/or rail network;</li> <li>• Traffic counts at the possible new access position (on alternative site 2) to determine the current level of service of the existing road network and possible capacity constraints;</li> <li>• Capacity analyses and new site access and geometric layout in terms of sight distance, intersection spacing, etc;</li> <li>• Investigation of possible roads and/or railway lines to be crossed (over or under); and</li> <li>• Writing of final report and recommendations on the proposed alternative sites.</li> </ul>
<p><b>Geology &amp; Geotechnical Assessment</b> <i>Sodhie Naicker – Kai Batla Mineral Industry Consultants</i></p>	<p>The second / EIA phase of the Geology and Geotechnical study will comprise trial pitting, detailed mapping and zoning of the site according to “Geotechnical Classification for Urban Development” (after Partridge, Wood and Brink), where an ArcGIS map will be produced, indicating different classes according to the classification stated.</p> <p>Through trial pitting and laboratory testing, engineering properties of the underlying soils and rock will be determined. This will therefore, enable the provision of acceptable bearing capacity of different horizons for foundation purposes, to classify the soils for use as backfill/ cover of the ash pile and to quantify the available material.</p> <p>Percolation tests will also be conducted at the base of selected trial pits in order to determine the permeability of the underlying soil rocks. This will assist in evaluating potential groundwater contamination and assessing the aquifers for vulnerability.</p> <p>An application to access information will be submitted to the Council of Geoscience to acquire results of any ground or airborne geophysical surveys as this will assist in the delineation of any geological structures on site.</p> <p>The specific objectives of the second (EIA) phase investigation can be summarized as:</p> <ul style="list-style-type: none"> <li>• Identify the soil / rock profile to a depth of approximately 3.0m or refusal of a TLB;</li> <li>• Determine the engineering properties and parameters of the near surface soils;</li> <li>• Assess the suitability of the near surface soils for use as backfill;</li> <li>• Determine the corrosivity of the soil and water encountered in the trial holes;</li> <li>• Assess the permeability of the near surface soils / rock by undertaking percolation tests at the bottom of selected trial pits;</li> <li>• Evaluate potential groundwater contamination and classify and assess the aquifers for vulnerability; and</li> <li>• Comment upon any geotechnical constraints that might impact on the proposed development.</li> </ul>

Study	Terms of Reference

## 9.4 Impact Assessment Methodology

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

Environmental Criteria	Description
<b>Nature</b>	A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
<b>Extent</b>	The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale
<b>Duration</b>	Indicates what the lifetime of the impact will be
<b>Intensity</b>	Describes whether an impact is destructive or benign
<b>Probability</b>	Describes the likelihood of an impact actually occurring
<b>Cumulative</b>	In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

**Table 28: Significance rating of classified impacts**

<b>Low impact (4 - 6 points)</b>	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
<b>Medium impact (7 - 9 points)</b>	Mitigation is possible with additional design and construction inputs.
<b>High impact (10 - 12 points)</b>	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
<b>Very high impact (13 - 16 points)</b>	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
<b>Status</b>	Denotes the perceived effect of the impact on the affected area.
<b>Positive (+)</b>	Beneficial impact.
<b>Negative (-)</b>	Deleterious or adverse impact.
<b>Neutral (/)</b>	Impact is neither beneficial nor adverse.

The suitability and feasibility of all proposed mitigation measures will be included in the assessment of significant impacts. This will be achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented. Mitigation measures identified as necessary will be included in an EMP. The EMP will be submitted together with the Environmental Impact Assessment Report (EIAR).

**Table 29: Criteria to be used for the Rating of Impacts**

CRITERIA	DESCRIPTION			
<b>EXTENT</b>	<b>National (4)</b> The whole of South Africa	<b>Regional (3)</b> Provincial and parts of neighbouring provinces	<b>Local (2)</b> Within a radius of 2 km of the construction site	<b>Site (1)</b> Within the construction site
<b>DURATION</b>	<b>Permanent (4)</b> Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	<b>Long-term (3)</b> The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	<b>Medium-term (2)</b> The impact will last for the period of the construction phase, where after it will be entirely negated	<b>Short-term (1)</b> The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
<b>INTENSITY</b>	<b>Very High (4)</b> Natural, cultural and social functions and processes are altered to extent that they permanently cease	<b>High (3)</b> Natural, cultural and social functions and processes are altered to extent that they temporarily cease	<b>Moderate (2)</b> Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	<b>Low (1)</b> Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
<b>PROBABILTY OF OCCURENCE</b>	<b>Definite (4)</b> Impact will certainly occur	<b>Highly Probable (3)</b> Most likely that the impact will occur	<b>Possible (2)</b> The impact may occur	<b>Improbable (1)</b> Likelihood of the impact materialising is very low

## 9.5 Environmental Impact Assessment Report

The EIAR will contain the following:

- Details of the EAP who compiled the report and their expertise to carry out an EIA;
- Detailed description of the activity/ies;
- A description of the environment that might be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- Details of the public participation process conducted during the Scoping Phase and the ongoing consultation during the EIA phase;
- Description of the need and desirability of the activity including advantages and disadvantages that the activity may have on the environment and the community that may be affected by the activity;
- An indication of the methodology used in determining the significance of potential environmental impacts;
- A summary of the findings and recommendations of any specialist report or report on a specialised process;
- A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;
- An assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources and the degree to which the impact can be mitigated;
- A description of any assumptions, uncertainties and gaps in knowledge;
- An opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- An environmental impact statement which contains a summary of the key findings of the environmental impact assessment; and a comparative assessment of the positive and negative implications of the activity.
- A draft Environmental Management Programme (EMPr) and
- Copies of any specialist reports and reports on specialised processes.

## 9.6 Draft Environmental Management Programme

During the compilation of the EIAR, a draft EMPr will be compiled in accordance with the EIA Regulations (2010). The draft Environmental Management Programme (EMPr) will provide the actions for the management of identified environmental impacts emanating from the project and a detailed outline of the implementation programme to minimise and/or eliminate the anticipated negative environmental impacts. The draft EMPr will provide strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.

The EMPr will include the following:

- Details of the person who prepared the EMPr and the expertise of the person to prepare an EMPr;
- Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in the EIAR, including environmental impacts or objectives in respect of operation or undertaking of the activities, rehabilitation of the environment and closure where relevant;
- A detailed description of the aspects of the activity that are covered by the draft EMPr;
- An identification of the persons who will be responsible for the implementation of the measures;
- Where appropriate, time periods within which the measures contemplated in the draft EMPr must be implemented;
- Proposed mechanisms for monitoring compliance with the EMPr and reporting thereon;

- An environmental awareness plan; and
- Procedures for managing incidents which have occurred as a result of undertaking the activity and rehabilitation measures.

## 9.7 Public Participation Process

The primary aims for the public participation process include the following:

- Meaningful and timeous participation of I&APs;
- Promoting transparency and an understanding of the proposed project and its potential environmental (social and biophysical) impacts;
- Accountability for information used for decision-making;
- Serving as a structure for liaison and communication with I&APs;
- Assisting in identifying potential environmental (social and biophysical) impacts associated with the development; and
- The needs, interests and values of I&APs must be considered in the decision-making process.

### 9.7.1 Advertising

The primary aim of adverts in the EIA phase is to provide information regarding the availability of reports for public review, as well as, if necessary, the advertisement of dates of public meetings.

### 9.7.2 Identification of and Consultation with Key Stakeholders

The identification of I&APs and key stakeholders will continue into the EIA phase of the project as the public participation process is a continuous process that runs throughout the duration of an environmental study.

### 9.7.3 I&AP Database

All I&AP information (including contact details), together with dates and details of consultations and a record of all issues raised is recorded within a comprehensive database of I&APs. This database will be updated on an on-going basis throughout the project, and will act as a record of the communication/involvement process.

### 9.7.4 Consultation and Public Involvement

Consultation with I&APs is considered to be critical to the success of any EIA process. Therefore, one-on-one consultation (via telephone calls and emails) and a public meeting during the EIA phase will be undertaken. The aim of this process will be to provide I&APs with details regarding the process and to obtain further comments regarding the project. Minutes of all meetings held will be compiled and forwarded to all attendees. These minutes will also be included in the EIR.

### 9.7.5 Issues Trail

All issues, comments and concerns raised during the public participation process of the EIA study will be compiled into an Issues Trail. This Issues Trail will be incorporated as part of the EIAR.

### 9.7.6 Public and Authority Review of the Draft Environmental Impact Assessment Report

The draft EIAR will be made available at public places for public review and comment. The draft EIR will also be submitted to DEA and LDEDET simultaneously. A 40 calendar day period will be allowed for this review process. An advertisement indicating the availability of this report for public scrutiny will be placed in a local and regional

newspaper. I&APs registered on the project database will be notified of the availability of this report by correspondence.

#### **9.7.7 Public and Authority Review of the Final Environmental Impact Report**

In order to give effect to regulation 56 (2) of the EIA Regulations (2010), before submitting the final EIR to the DEA, the EAP must give registered I&APs access to, an opportunity to comment on the report in writing within 21 days.

#### **9.7.8 Authority Review and Decision-making**

After the public review period, all relevant comments received from the public will be considered and included into the final EIAR. This final document will be submitted to DEA for final review and decision-making.

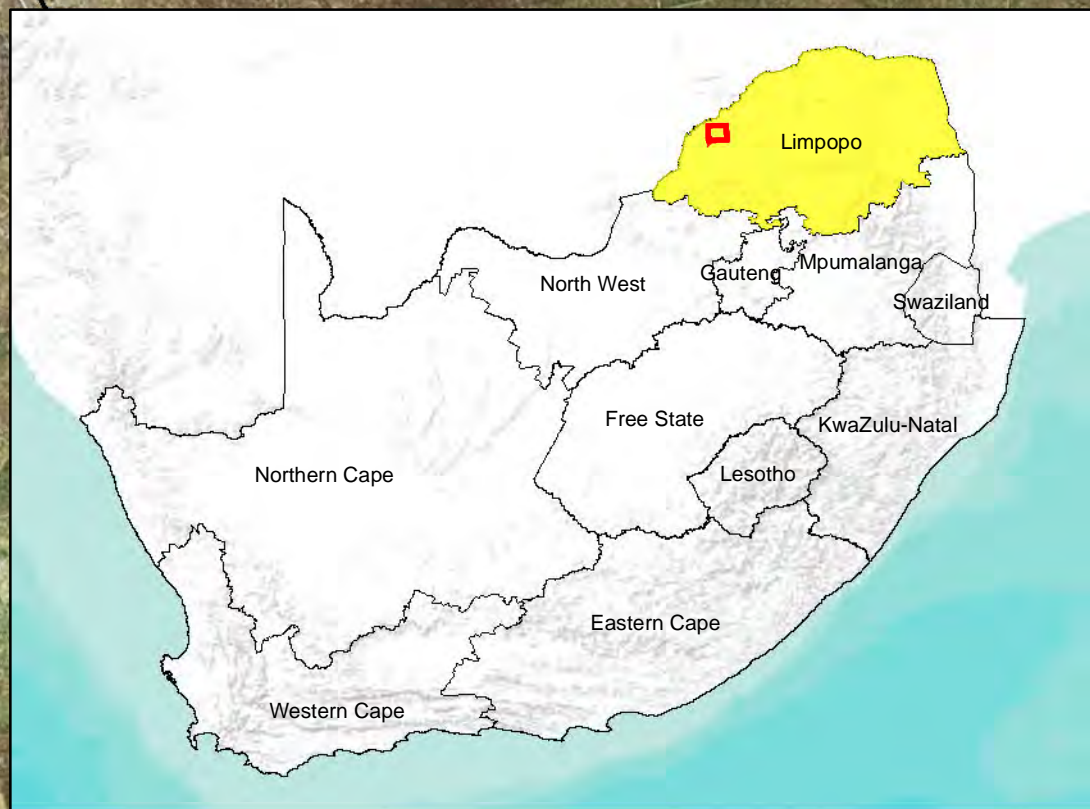
#### **9.7.9 Environmental Authorisation and Waste Management License**

On receipt of the environmental authorisation and waste management license for the project, I&APs registered on the project database will be informed of it and its associated terms and conditions by correspondence.











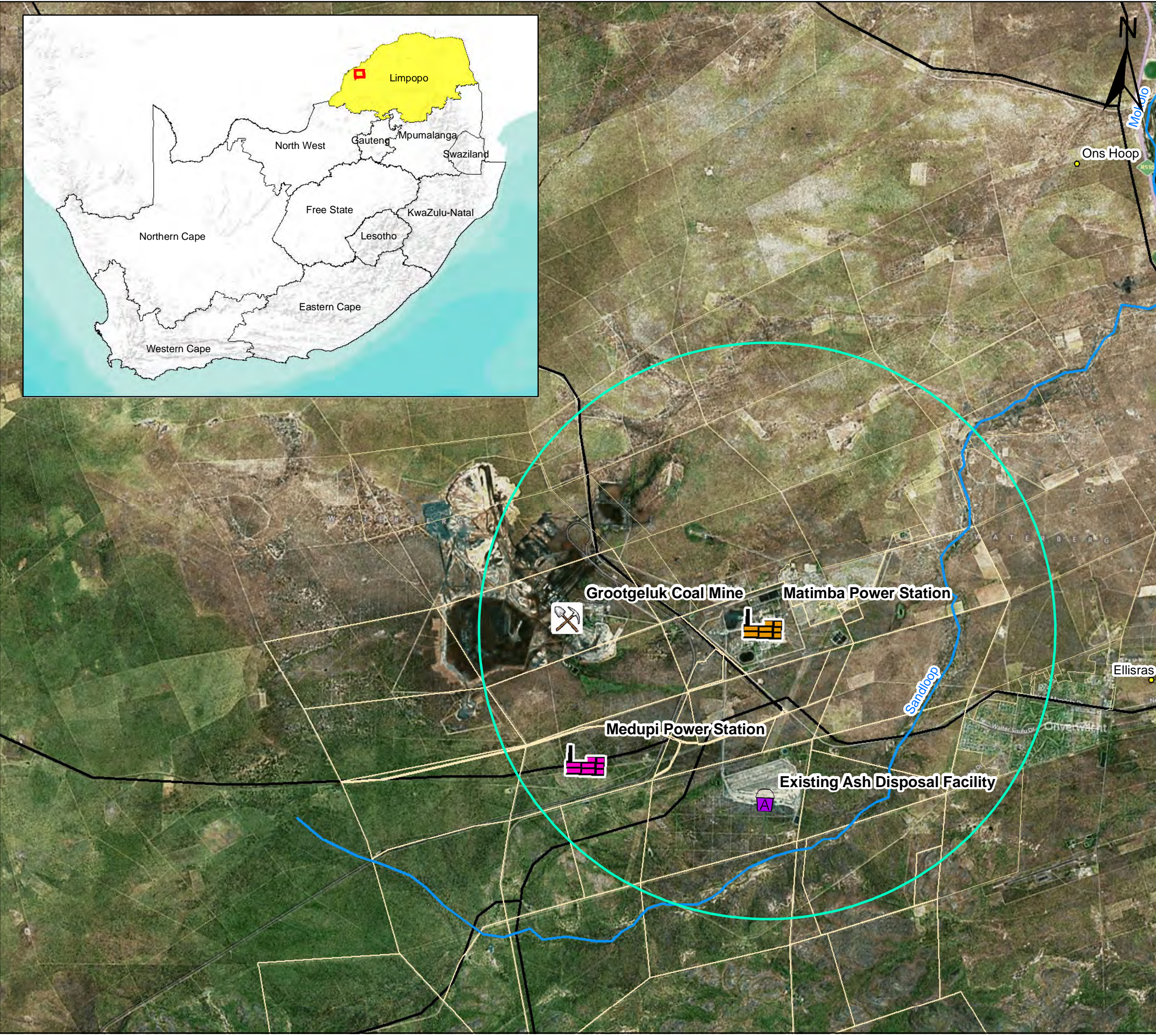
**APPENDIX A**  
**LOCALITY MAP**

# MATIMBA EIA: LOCALITY MAP



## Legend

-  Rivers
-  Roads
-  Existing Ash Disposal Facility
-  Grootgeluk Coal Mine
-  Matimba Power Station
-  Medupi Power Station
-  Property Boundaries
-  8km Study Area



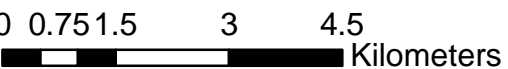
Coordinate System: LO31 WGS84  
 Projection: Transverse Mercator  
 Datum: WGS 1984  
 False Easting: 0.0000  
 False Northing: 0.0000  
 Central Meridian: 31.0000  
 Scale Factor: 1.0000  
 Latitude Of Origin: 0.0000  
 Units: Meter

Data Sources:  
 Demarcation Board, SANBI,  
 DTI, Bing Maps


Date: 09 April 2013  
 Created by: Luke Moore  
 RHDHV Ref: E02.JNB.001222

Scale:

1:100 000



0 0.75 1.5 3 4.5 Kilometers



**APPENDIX B**  
**ACCEPTANCE OF APPLICATION**



## **environmental affairs**

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

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**NEAS Reference: DEAEIA/0001442/2012**

**Reference: 14/12/16/3/3/56**

**Enquiries: Mmatlala Rabothata**

**Tel: 012 395 1768/1694 Fax: 012 320 7539 E-mail: mmatlala@environment.gov.za**

Malcom Roods  
SSI Engineers and Environmental Consultants (Pty) Ltd  
PO Box 867  
**GALLO MANOR**  
2052

Fax: 011 798 6010  
Tel: 011 798 6442

### **PER FACSIMILE / MAIL**

Dear Sir/Madam

### **ACKNOWLEDGEMENT OF RECEIPT AND ACCEPTANCE OF NEW APPLICATION FOR ENVIRONMENTAL AUTHORISATION (SCOPING & EIA PROCESS) FOR THE PROGRESSIVE ASHING AT THE EXISTING ASH DISPOSAL FACILITIES AT THE MATIMBA POWER STATION ASH DISPOSAL FACILITY, LEPHALALE, LIMPOPO PROVINCE**

The Department confirms having received the Integrated Application Form; details of EAP and Declaration of Interest; project schedule and locality map on 3 September 2012 for environmental authorisation for the abovementioned project. The Application is accepted.

Please include both reference numbers (NEAS Reference and DEA Reference), as listed above, on all documents and correspondence submitted to the Department.

In addition, please consider the following during compilation of reports for this application for environmental authorisation:

- All applicable Departmental Guidelines must be considered throughout the application process. These can be downloaded from the Department's website: [www.environment.gov.za](http://www.environment.gov.za), Environmental Impact Management button, listed under "EIA Administration": Integrated Environmental Management Information Series link. These include, but are not limited to, the following topics: Scoping, Environmental Impact Reporting, Stakeholder Engagement, Specialist Studies, Impact Significance, Cumulative Effects Assessments, Alternatives in EIA and Environmental Management Plans.
- Please be advised that in terms of the EIA Regulations and NEMA the investigation of alternatives is mandatory. Alternatives must therefore be identified, investigated to

determine if they are feasible and reasonable. It is also mandatory to investigate and assess the option of not proceeding with the proposed activity (the "no-go" option).

- Should water, solid waste removal, effluent discharge, stormwater management and electricity services be provided by the municipality, you are requested to provide this office with written proof that the municipality has sufficient capacity to provide the necessary services to the proposed development. Confirmation of the availability of services from the service providers must be provided together with the reports to be submitted.
- In the reports to be submitted it must clearly be demonstrated in which way the proposed development will meet the requirements of sustainable development. You must also consider energy efficient technologies and water saving devices and technologies for the proposed development. This could include measures such as the recycling of waste, the use of low voltage or compact fluorescent lights instead of incandescent globes, maximising the use of solar heating, the use of dual flush toilets and low-flow shower heads and taps, the management of storm water, the capture and use of rainwater from gutters and roofs, the use of locally indigenous vegetation during landscaping and the training of staff to implement good housekeeping techniques.
- A detailed and complete EMPr must be submitted with the EIR. This EMPr must not provide recommendations but must indicate actual remediation activities which will be binding on the applicant. Without this EMPr the documents will be regarded as not meeting the requirements and will be returned to the applicant for correction.
- The applicant/EAP is required to inform this Department in writing upon submission of any draft report, of the contact details of the relevant State Departments (that administer laws relating to a matter affecting the environment) to whom copies of the draft report were submitted for comment. Upon receipt of this confirmation, this Department will in accordance with Section 240(2) & (3) of the National Environmental Management Act, 1998 (Act 107 of 1998) inform the relevant State Departments of the commencement date of the 40 day commenting period, or 60 days in the case of the Department of Water Affairs for waste management activities which also require a licence in terms of the National Water Act, 1998 (Act 36 of 1998).
- Should it be necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999), please submit the necessary application to SAHRA or the relevant provincial heritage agency and submit proof thereof with the Basic Assessment Report/Environmental Impact Assessment Report. The relevant heritage agency should also be involved during the public participation process and have the opportunity to comment on all the reports to be submitted to this Department.

You are required to submit the final site layout plan together with the Final EIR to the Department. All available biodiversity information must be used in the finalisation of the layout plan.

The Environmental Management Programme (EMPr) submitted as part of the application for environmental authorisation must include the following:

- All recommendations and mitigation measures to be recorded in the Final EIR.
- A plant rescue and protection plan which allows for the maximum transplant of conservation important species from areas to be transformed. This plan must be compiled by a vegetation specialist familiar with the site in consultation with the ECO and be implemented prior to commencement of the construction phase.
- An open space management plan to be implemented during the construction and operation of the facility.

- A re-vegetation and habitat rehabilitation plan to be implemented during the construction and operation of the facility including timeframes for restoration which must indicate rehabilitation within the shortest possible time after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
- An alien invasive management plan to be implemented during construction and operation of the facility. The plan must include mitigation measures to reduce the invasion of alien species and ensure that the continuous monitoring and removal of alien species is undertaken.
- A storm water management plan to be implemented during the construction and operation of the facility. The plan must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion. The plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.
- An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.
- An erosion management plan for monitoring and rehabilitating erosion events associated with the facility. Appropriate erosion mitigation must form part of this plan to prevent and reduce the risk of any potential erosion.
- A traffic management plan for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan must include measures to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.
- An environmental sensitivity map indicating environmental sensitive areas and features identified during the EIA process.
- Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmental sensitive areas from construction impacts including the direct or indirect spillage of pollutants.

You are requested to submit two (2) electronic copies (the main report must be separated from the Appendices (each appendix saved separately) (CD/DVD) and two (2) hard copies of both the Draft and Final Report to the Department. The hard copies must be double-sided printed; double-punched and must be bound using a lever arch file (two or four holes).

The EAP must, in order to give effect to regulation 56 (2), before submitting the final EIR to the Department give registered interested and affected parties access to, and an opportunity to comment on the report in writing within 21 days.

In terms of regulation 67 of the EIA Regulations, 2010 this application will lapse if the applicant (or the EAP on behalf of the applicant) fails to comply with a requirement in terms of the Regulations for a period of six months after having submitted the application, unless the reasons for failure have been communicated to and accepted by this Department.

You are hereby reminded of Section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.

Yours sincerely

~~Mmatlala~~  
Mr Mark Gordon

**Chief Director: Integrated Environmental Authorisations**  
**Department of Environmental Affairs**

Letter signed by: Ms Mmatlala Rabothata

Designation: Environmental Officer: Integrated Environmental Authorisations

Date: 17/09/12

CC:	Deidre Herbst	Eskom	Tel: 011 800 3501	Fax: 086 660 6092
	Mrs Maria Cocquyt	Lephalale Local Municipality	Tel: 014 762 1423	Tel: 014 763 5662

**APPENDIX C**  
**I&AP DATABASE**



**I&AP DATABASE FOR THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITY FOR  
THE MATIMBA POWER STATION IN LEPHALALE, LIMPOPO PROVINCE**

<b>Name</b>	<b>Company</b>
-	Highmast Properties
-	Altoostyd CC
-	Batis Prop 10 CC
Susanna Gouws	Land Owner
Mervin Govender	Exxaro Coal ( Pty) Ltd
Hilton Atkinson	Exxaro Coal ( Pty) Ltd
Marius Fuls	Exxaro Coal ( Pty) Ltd (Manketti Reserve)
-	Farm George Town
-	Onsnamu Nursery Pty Ltd
-	Plaaslike Owerheid Van Marapong
-	Rooibosrand Dev (PTY) Ltd
-	Sunfox 33 CC
Allan Malherbe	Triple M Game Ranch
AH Grobbelaar	Farm Jacobsloop
Andries Van Rensburg	Farms Hanover, Colesberg & Adelaide
Anna Shongoane	Tribal Authority: Setateng, Mmatladi
Bheki Nxumalo	-
Bob Naidoo	-
Carel Erasmus	Farm Grietasvlakte: Portion 1
Clive Robinson	Farms Werkendam (Portion 1) & Rietspruit
D De Beer	Noed Family Trust
EJ Pretorius	Farm Grootfontein
EL Grove	Farm Gorkum
Erasmus Christiaan	Farm Worcester
FW Heystek	Farm Good Hope
Francois Van der Mark	Farm Marseilles: Portion 1 of portion 2
Frederick Malan	Halbosrust & Grootfontein
G Ravazzotti	Ellington Ranch (Pty)Ltd & Farms Toulon,
Gysbert Vlok	Marseilles
H Kotze	Rhinoland Safaris (Pty)Ltd
Hendrik Van Rensburg	Farm Norfolk
Herman Pretorius	Ellisras & Hoornbosch Farmers' Union
Hester Ellis	Farm Grietasvlakte: Portion 2
Jaco Breedt	Uiterstevreden (Pty) Ltd
Jacobus De Wet	Farm New York
Jacobus Myburgh	Farm Zwellendam
James Higgs	Farms Jacobsloop
Jan Eckard	Transvaal Agricultural Union
Jannie Pretorius	Farm Vucht: Portion 4
J Potgieter	Preymentos Beleggings CC
JS Van der Merwe	Farms Portlock & Windsor

JC Duvenhage	Farm Caledon
Koos Viljoen	Farm Over Yssel
Loots Marthienus Frederick	-
Maria Cocquyt	-
Marius Kotze	Rhinoland Safaris (Pty)Ltd
Marry Molekwa	Lephalale Local Municipality
Menno Glas	Sonhel Boerdery (Pty)Ltd
MF Loots	Farm Zongezien: Portion 1
MI Shiko	-
Michiel Erasmus	Farm Wellington
Nico Meyer	Matlabas Spares
P Ellis	Farm Grietasvlakte
P Vastapane	Farm George
Petrus Van Staden	Farm Beaufort
Phillip Bronkhorst	Safari Lands
PM Tomaszewski	-
P Van Rensburg	Farm Beaufort
RJ Setlane	Shonghoane Chief Representative
Ronell Kruger	Ellisras Tourism Association
Ronnie Wiehahn	Wild Study & Kolobe Bush Lodge
Johannes Van Rooyen	Farm Kalkfontein
Louise Van Rooyen	Farm Kalkfontein
TA Smit	Preymentos Beleggings CC
Theresa White	Kudu Canyon & Waterberg Nature Conservancy
WA Lewies	Transvaal Agricultural Union
M.J.Selokela	Lephalale Local Municipality
L. S Manamela	Lephalale Local Municipality
J.Selokela	Lephalale Local Municipality
G. B.Koadi	Lephalale Local Municipality
Victor Monyepao	Lephalale Local Municipality
Catchlife Mutshavi	Lephalale Local Municipality
Dries De Ridder	Lephalale Local Municipality
Johan Van den Berg	Lephalale Local Municipality
JPW Erasmus	Lephalale Local Municipality
Michael Mohatshe	Lephalale Local Municipality
Tebogo Ntshangase	Lephalale Local Municipality
Municipal Manager	Waterberg District Municipality
A K Kharivhe	Department of Mineral Resources
Azwihangwisi Mulaudzi	Department of Minerals and resource
Daisy Mafubelu	Department of Health and Social Development
Floyd Brink	Department of Roads and Transport
MM Komape	Department of Water Affairs
Raletjena Moloko	Department of Water Affairs

Steven Kgobalala	Department of Agriculture
LP Makhura	LDEDET-Waterberg district
Maylene Broderick	LDEDET
Tinyiko Malungani	LDEDET

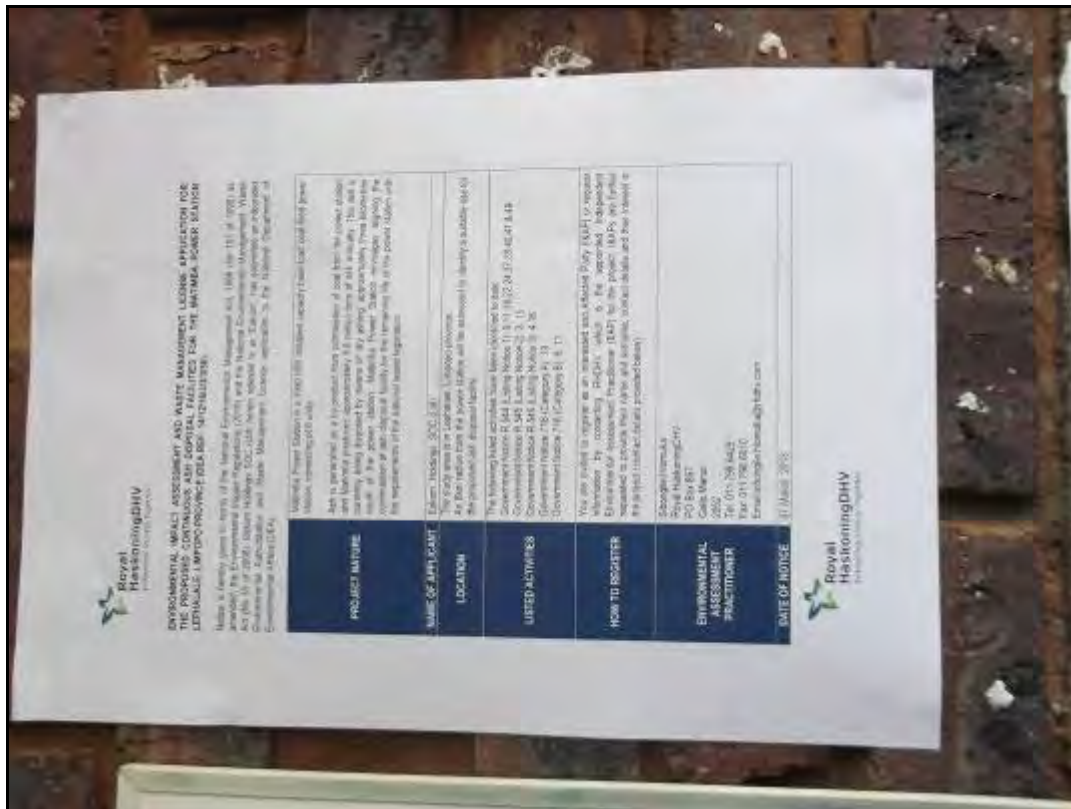
**APPENDIX D**  
**SITE NOTICES**

**ENVIRONMENTAL IMPACT ASSESSMENT AND WASTE MANAGEMENT LICENSE APPLICATION FOR THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITIES FOR THE MATIMBA POWER STATION LEPHALALE, LIMPOPO PROVINCE (DEA REF: 14/12/16/3/3/56).**

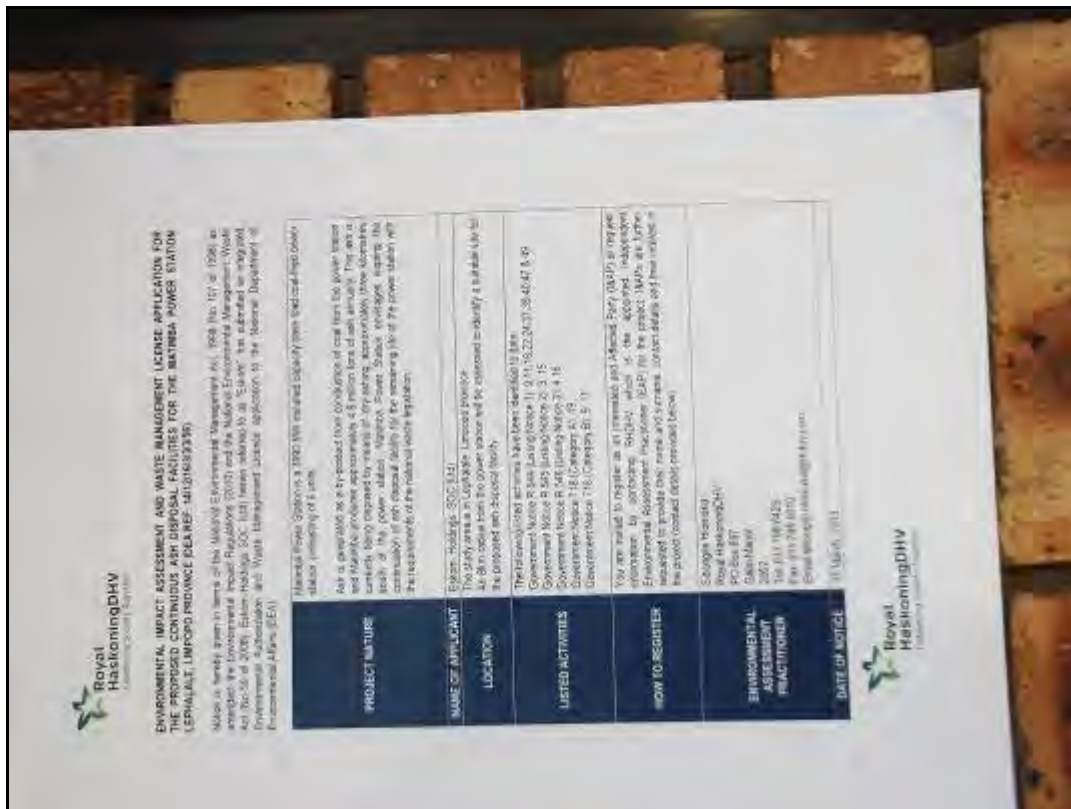
Notice is hereby given in terms of the National Environmental Management Act, 1998 (No 107 of 1998) as amended, the Environmental Impact Regulations (2010) and the National Environmental Management: Waste Act (No 59 of 2008). Eskom Holdings SOC (Ltd) herein referred to as "Eskom", has submitted an integrated Environmental Authorisation and Waste Management Licence application to the National Department of Environmental Affairs (DEA).

<b>PROJECT NATURE</b>	<p>Matimba Power Station is a 3990 MW installed capacity base load coal-fired power station, consisting of 6 units.</p> <p>Ash is generated as a by-product from combustion of coal from the power station and Matimba produces approximately 4.8 million tons of ash annually. This ash is currently being disposed by means of 'dry ashing' approximately three kilometres south of the power station. Matimba Power Station envisages aligning the continuation of ash disposal facility for the remaining life of the power station with the requirements of the national waste legislation.</p>
<b>NAME OF APPLICANT</b>	Eskom Holdings SOC (Ltd)
<b>LOCATION</b>	<p>The study area is in Lephalale, Limpopo province.</p> <p>An 8km radius from the power station will be assessed to identify a suitable site for the proposed ash disposal facility.</p>
<b>LISTED ACTIVITIES</b>	<p>The following listed activities have been identified to date:</p> <p>Government Notice R.544 (Listing Notice 1): 9,11,18,22,24,37,39,40,47 &amp; 49          Government Notice R.545 (Listing Notice 2): 3, 15          Government Notice R.546 (Listing Notice 3): 4,16          Government Notice 718 (Category A): 19          Government Notice 718 (Category B): 9, 11</p>
<b>HOW TO REGISTER</b>	<p>You are invited to register as an Interested and Affected Party (I&amp;AP) or request information by contacting RHDHV which is the appointed Independent Environmental Assessment Practitioner (EAP) for the project. I&amp;APs are further requested to provide their name and surname, contact details and their interest in the project (contact details provided below).</p>
<b>ENVIRONMENTAL ASSESSMENT PRACTITIONER</b>	<p>Phyllis Kalele          Royal HaskoningDHV          PO Box 25302          Monument Park          0105, Pretoria          Tel: 012 367 5916          Fax: 012 367 5878          Email: phyllis.kalele@rhdhv.com</p>
<b>DATE OF NOTICE</b>	February 2013

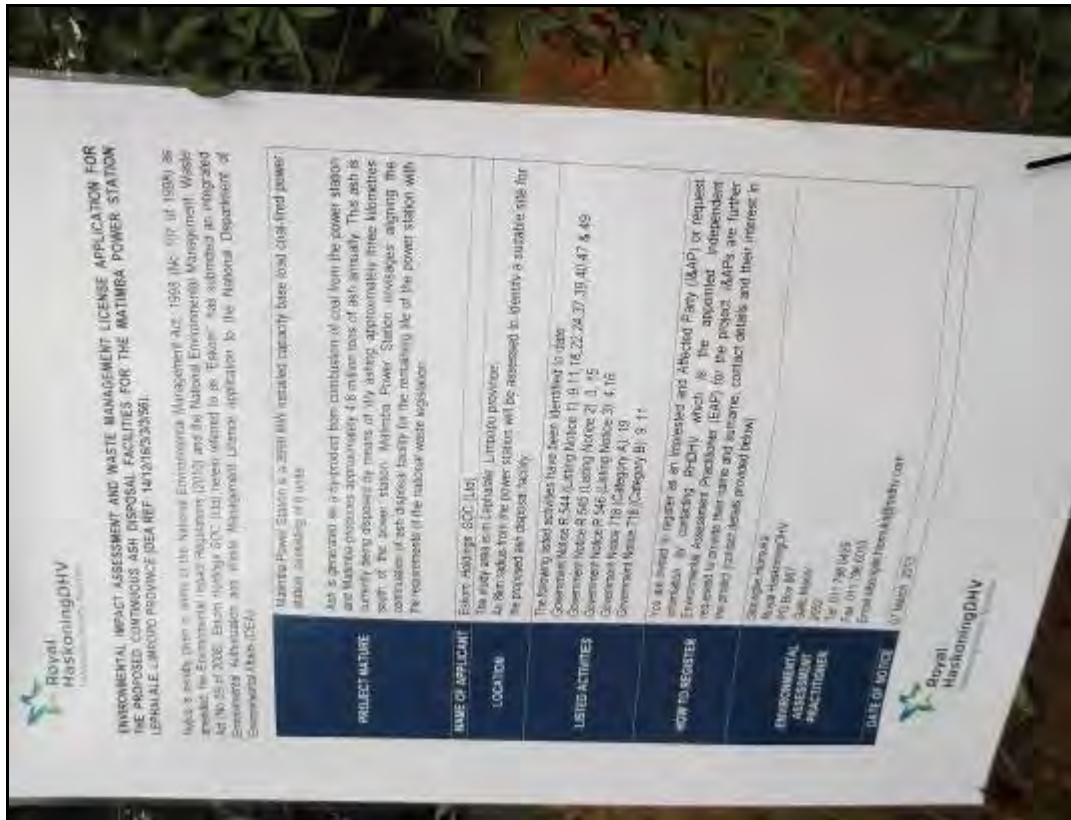
# SITE NOTICES-THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITY FOR THE MATIMBA POWER STATION IN LEPHALALE, LIMPOPO PROVINCE



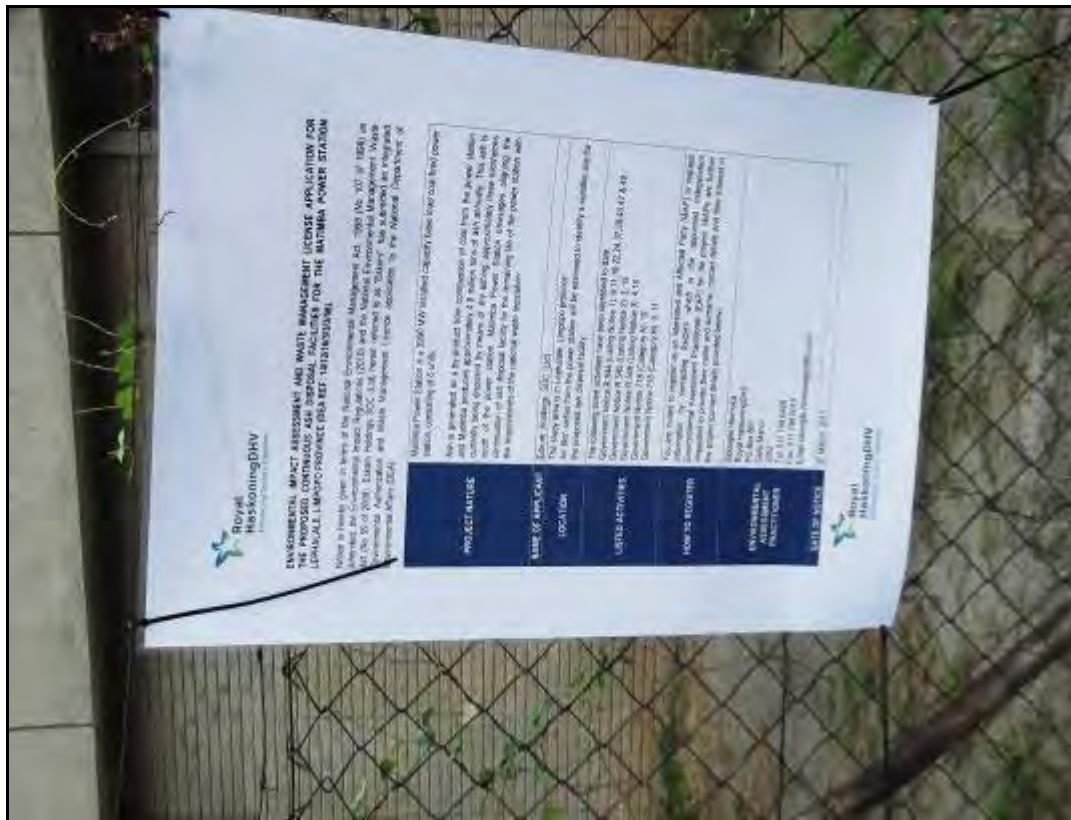
Notice displayed at the Marapong Clinic



Notice displayed at the Marapong Post Office.



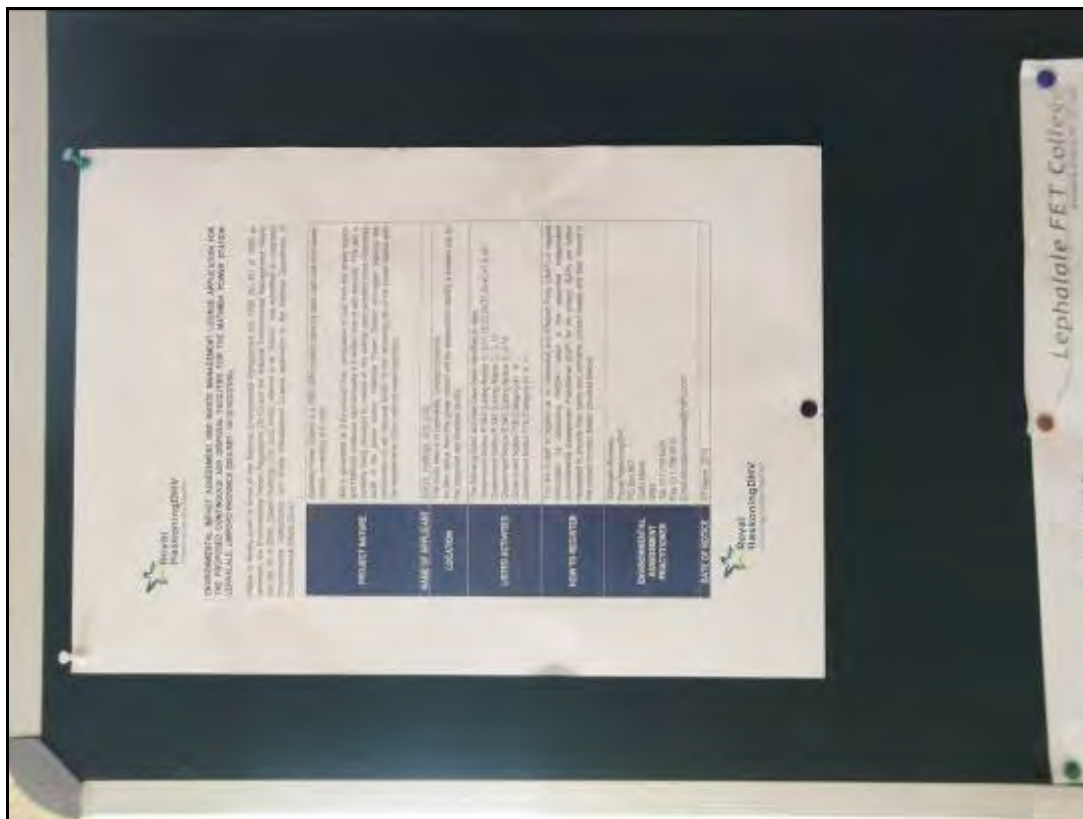
Notice displayed at the Medupi Power Station– turn off



Notice displayed at the site



Notice displayed at the site



Notice displayed inside the Marapong Public Library

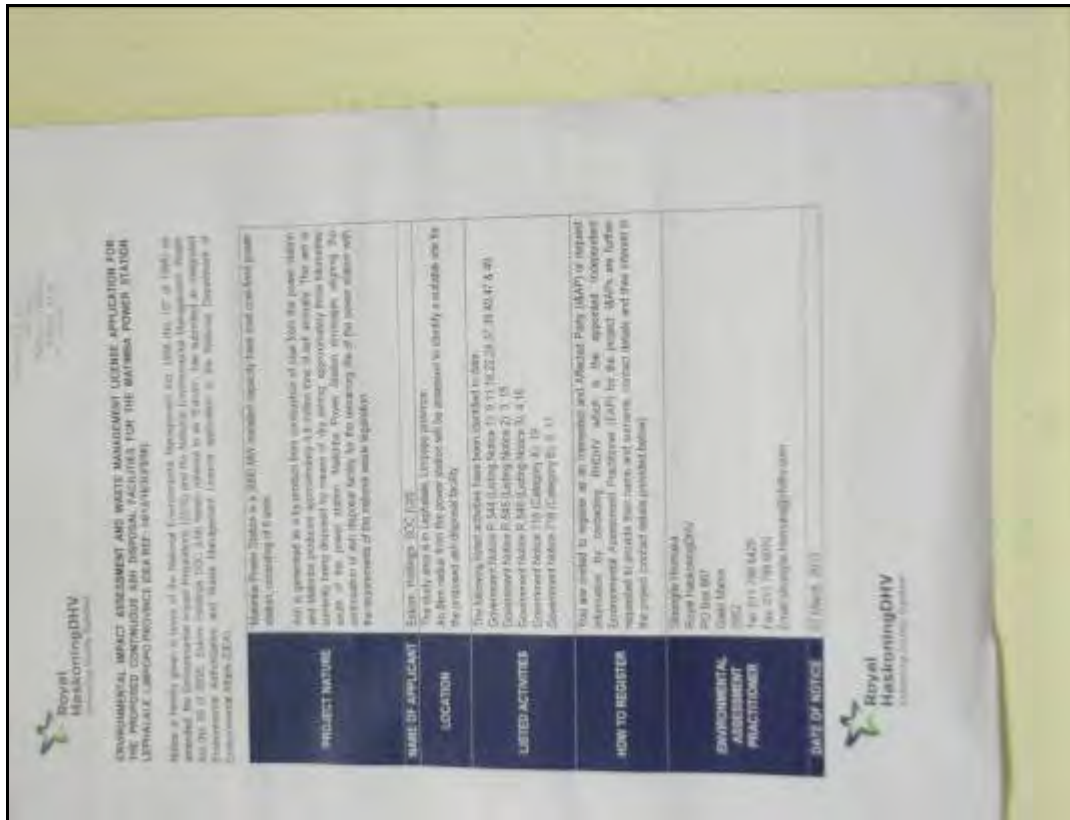




Notice displayed outside the Marapong Public Library



Notice displayed outside the Mogol Social Club



Notice displayed inside the Lephalale Public Library



Notice displayed inside the Lephalale Municipality Offices



**APPENDIX E**  
**BACKGROUND INFORMATION DOCUMENT**

**ENVIRONMENTAL IMPACT ASSESSMENT AND WASTE MANAGEMENT  
LICENSE APPLICATION FOR THE PROPOSED CONTINUOUS ASH  
DISPOSAL FACILITIES FOR THE MATIMBA POWER STATION,  
LEPHALALE, LIMPOPO PROVINCE**

**DEA REF: 14/12/16/3/3/3/56**

**BACKGROUND INFORMATION DOCUMENT**

**FEBRUARY 2013**



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## WHAT DOES THIS DOCUMENT TELL YOU?

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This document aims to provide you, as an Interested and Affected Party (I&AP), with background information regarding the proposed continuous ash disposal facility at Matimba Power Station, in Lephalale, Limpopo Province. The document also provides information regarding the Environmental Impact Assessment (EIA) and Waste Management License (WML) application processes to be undertaken.

Any person, company, authority or other entities that might be directly or indirectly affected by the proposed activity can register as an I&AP. This includes, but is not limited to landowners, tenants, municipal and provincial authorities, interest groups, Non-Government Organisations and conservation groups.

Furthermore, the document advises how you can become involved in the project, receive information and/or raise issues, which may concern and/or be of interest to you. The sharing of information forms the basis of the Public Participation Process (PPP) and offers you the opportunity to become actively involved in the project from the outset. Public Participation plays an important role in informing the EIA process as input from I&APs ensures that all potential issues of concern are considered early within the study.

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## STUDY AREA

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The Matimba Power Station is located near Lephalale (formerly Ellisras) in the Limpopo Province. The current ash disposal facility is approximately three kilometres south of the Matimba Power Station on the Eskom owned farm Zwartwater 507LQ.

Matimba Power Station envisages the continuation of ash disposal (dry ashing) and therefore, a study area encompassing an 8km radius from the power station will be assessed to identify a suitable location for the proposed ash disposal facility.

**Refer to Appendix 1 for the locality map.**

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## PROJECT DESCRIPTION

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Eskom Holdings SOC (Ltd), herein referred to as Eskom, generates, transmits and distributes electricity. Eskom supplies about 95 % of the country's electricity and part of this electricity is generated at the Matimba Power Station.

Matimba Power Station is a 3990MW installed capacity base load coal-fired power station, consisting of 6 units. Matimba is a direct dry cooling power station, an innovation necessitated by the severe shortage of water in the area where it is situated. The station obtains its coal from the Exxaro Grootegeluk Colliery for the generation of electricity.



Figure 1: Photo of Matimba power station

Ash is generated as a by-product from combustion of coal from the power station and Matimba produces approximately 4.8 million tons of ash annually. This ash is currently being disposed by means of 'dry ashing' approximately three kilometres south of the power station. To assist with the spreading of ash and on site operations, a number of equipment is used at the current ash disposal facility, these include: conveyors, spreaders, bull dozer, front end loader, tipper, grader and water tanker. Matimba Power Station envisages aligning the continuation of ash disposal for the remaining life of the power station with the requirements of the national waste legislation.

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## ENVIRONMENTAL STUDIES

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### Why are Environmental Studies Needed?

According to the EIA Regulations (2010) promulgated under the National Environmental Management Act (No 107 of 1998) (as amended) and the National Environmental Management: Waste Act (No 59 of 2008), the following listed activities are triggered by the proposed continuous ash disposal facilities:

Legislation	Activity No
GN544 Listing Notice 1	9,11,18,22,24,37,39,40,47 & 49

<b>GN 545 Listing Notice 2</b>	3 & 15
<b>GN 546 Listing Notice 3</b>	4 & 16
<b>GN.718 Category A</b>	19
<b>GN.718- Category B</b>	9 & 11

In order to obtain an informed decision from the National Department of Environmental Affairs (DEA), an Environmental Impact Assessment process is being undertaken.

An Environmental Impact Assessment (EIA) is an effective planning and decision-making tool, which allows for the identification of potential environmental consequences of a proposed project, and its management through the planning process. The EIA process will be undertaken in two phases as explained below:

**(i) Environmental Scoping Study**

In the Environmental Scoping Study (ESS), desk-top specialist studies and limited site visit will identify potential issues which require further investigation within the EIA phase. Input from the public through the public participation process provides valuable input in the identification of issues requiring investigation within this EIA process.

The ESS will highlight areas that should be avoided in order to minimise potential impacts, and evaluate the alternative sites recommended. The Scoping Study will recommend the most favourable alternative site/s for the proposed continuous ash disposal facility for further investigation in the Environmental Impact Assessment phase.

**(ii) Environmental Impact Assessment Phase**

The EIA phase will aim to achieve the following:

- to provide an overall assessment of the social and biophysical environments of the affected area by the proposed continuous ash disposal facilities;
- to undertake a detailed assessment of the preferred site/s in terms of environmental criteria including the rating of significant impacts;
- to identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- to undertake a fully inclusive public participation process to ensure that I&AP issues and concerns are recorded, addressed and commented on.

As part of the EIA and WML application processes, potential impacts will be identified and assessed through the following specialist studies which will be undertaken during the EIA Phase of the project:

<b>SPECIALIST FIELD</b>	<b>ORGANISATION</b>
<b>Noise</b>	Jongens Keet Associates
<b>Soils and Agricultural Potential</b>	Terra Soil Science
<b>Heritage</b>	National Cultural History Museum
<b>Social Assessment</b>	Royal HaskoningDHV
<b>Visual Assessment</b>	Royal HaskoningDHV
<b>Air Quality Assessment</b>	Royal HaskoningDHV
<b>Surface Water Screening</b>	Royal HaskoningDHV
<b>Traffic Assessment</b>	Royal HaskoningDHV
<b>Hydrology Survey</b>	GCS Water & Environmental Consultants
<b>Geohydrological Survey</b>	GCS Water & Environmental Consultants
<b>Biodiversity</b>	Bathusi Environmental Consulting
<b>Engineering Design</b>	Jeffares and Green (Pty) Ltd
<b>Geology and Geotechnical</b>	Kai Batla Mineral Industry Consultants
<b>Legal Review</b>	Imbewu Sustainability Legal Specialists (Pty) Ltd

**PUBLIC PARTICIPATION PROCESS**

It is important that relevant I&APs are identified and involved in the public participation process from the outset of the project. To ensure effective public participation, the following steps will be undertaken during the EIA study (refer to Figure 2).

**POTENTIAL ENVIRONMENTAL IMPACTS**

Figure 2: Typical Public Participation Process Activities to be undertaken

- Advertise the EIA process & erect site notices
- Register I&APs and key stakeholders on the database (on-going)
- Advertise the availability of the draft Scoping Report and Plan of Study (PoS) for EIA for public review (60) day commenting period)
- Consultation with, and transfer of information to I&APs through focus group meetings and public meetings
- Incorporate comments received from I&APs & Stakeholders during the draft Scoping phase into the final Environmental Scoping Report (ESR) and PoS for EIA and circulate the report to I&APs for a period of 21 days
- Newsletters (updating the I&APs about the EIA Process)
- Advertise the availability of the draft Environmental Impact Report (EIR) and Environmental Management Programme (EMPr) for public review (60 day commenting period)
- Consultation with, and transfer of information to I&APs through focus group meetings and public meetings
- Incorporate comments received from I&APs & Stakeholders during the EIA phase into the final EIR and EMPr and circulate the report to I&APs for a period of 21 days
- Advertise & notify I&APs of DEA's decision

Further identification of and consultation with I&APs

4. In writing, contacting consultants if you have a query, comment or require further project information; and
5. By reviewing and commenting on the Scoping and EIA Reports within the stipulated review periods.

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### COMMENTS AND QUERIES

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Please direct all comments, queries or issues to:

**Sibongile Hlomuka**  
**Public Participation Consultant**  
**Royal HaskoningDHV**  
**PO Box 867**  
**Gallo Manor, 2052**  
**Johannesburg**  
 ☎: 011 798 6458  
 📠: 011 798 6010  
 ✉: [Sibongile.hlomuka@rhdhv.co.za](mailto:Sibongile.hlomuka@rhdhv.co.za)

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### WHAT IS YOUR ROLE?

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If you consider yourself an I&AP for the proposed project, you are encourage to make use of the opportunities created by the public participation process to become involved in the process and raise the issues and concerns which affect and/or interest you, and about which you require more information.

How can you get involved?

1. By responding (by phone, fax or e-mail) to our invitation for your involvement in the process;
2. By completing the attached comment form and mailing or faxing it to Royal HaskoningDHV
3. By attending the meetings to be held during the course of the project. Should you register as an I&AP you will be invited to attend these meetings. The meeting dates will also be advertised in local newspapers and registered I&APs will be notified by mail as well;



**ENVIRONMENTAL IMPACT ASSESSMENT AND WASTE MANAGEMENT LICENSE APPLICATION FOR THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITIES FOR THE MATIMBA POWER STATION, LEPHALALE, LIMPOPO PROVINCE (DEA REF: 14/12/16/3/3/56).**

**REGISTRATION AND COMMENT FORM**

**KINDLY COMPLETE THIS FORM IN DETAIL AND RETURN IT TO:**

Sibongile Hlomuka  
Royal HaskoningDHV  
P.O Box 867  
Gallo Manor, 2052  
Johannesburg

Telephone: 011 798 6458  
Fax: 011 798 6010  
Email: sibongile.hlomuka@rhdhv.com

**PERSONAL DETAILS:**

Title: ..... First Name: .....

Surname: .....

E-Mail: .....

Telephone: ..... Fax: .....

Organisation (if applicable): .....

Capacity (e.g. Chairperson, member, etc): .....

Physical Address: .....

Town: ..... Code: .....

Postal Address: .....

Town: ..... Code: .....

1. What is your main area of interest with regards to the proposed project?  
.....  
.....  
.....  
.....  
.....

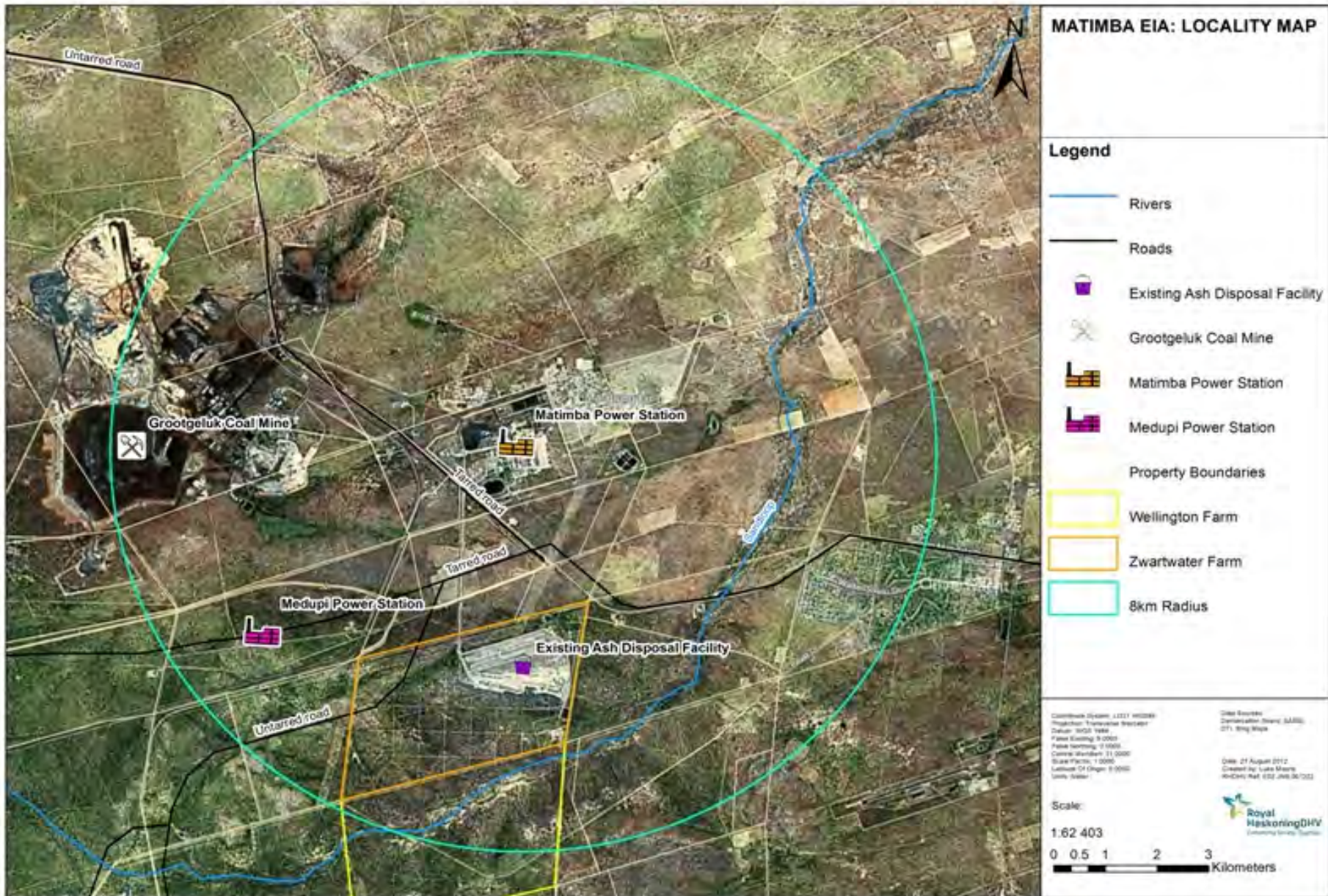
2. Do you have any points of concern or support regarding the proposed project?  
If "yes", please briefly list these in point form:  
.....  
.....  
.....  
.....  
.....

Yes	No
-----	----

3. Are there any additional stakeholders who you feel should be consulted with regards to the proposed project?  
If "yes" please list their names and contact details below:  
.....  
.....  
.....

Yes	No
-----	----

# LOCALITY MAP



**APPENDIX F**  
**NEWSPAPER ADVERTISEMENT**

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND WASTE MANAGEMENT LICENSE APPLICATION FOR THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITY FOR THE MATIMBA POWER STATION IN LEPHALALE, LIMPOPO PROVINCE. (DEA REF: 14/12/16/3/3/3/56)**

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Ash is generated as a by-product from combustion of coal from the Matimba Power Station which produces approximately 4.8 million tons of ash annually. This ash is currently being disposed of by means of 'dry ashing' approximately three kilometres south of the power station. Eskom proposes the construction of a new ash disposal facility in order to ensure that the Matimba Power Station is able to accommodate its ashing requirements for the remaining life (44 years) of the power station.

**Consequently, Eskom Holdings SOC Limited intends to undertake a full Scoping and EIA study and submit the Environmental Scoping Report (ESR) and Environmental Impact Assessment Report (EIAR) to DEA in support of the proposed project.**

**NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL SCOPING REPORT FOR PUBLIC REVIEW**

All I&APs are hereby notified that the draft Environmental Scoping Report (ESR) will be available for public comment from **29 April 2013 to 09 June 2013**. The draft ESR will summarise key environmental issues identified to date and will be available at the following places:

- Offices of Matimba Power Station (Nelson Mandela Drive, Lephalale)
- Lephalale Public Library (Lephalale Municipality offices, corner Joe Slovo & Douwater Roads)
- Marapong Community Library (1456 Sethora Street, Marapong)
- Manketti Reserve ( Mogol road, Lephalale)
- Offices of Royal HaskoningDHV (78 Kalkoen Street, Monument Park, Pretoria)
- Royal HaskoningDHV website ([www.rhdhv.co.za/pages/services/environmental/current-projects.php](http://www.rhdhv.co.za/pages/services/environmental/current-projects.php))
- Eskom Holdings SOC (Ltd) website ([www.eskom.co.za/eia](http://www.eskom.co.za/eia))

**WHO SHOULD YOU CONTACT?**

Royal HaskoningDHV (RHDHV) is the appointed service provider by Eskom to provide independent Environmental Assessment Practitioner (EAP) services for undertaking the required Environmental Impact Assessment and Public Participation (PP) process for the project. To register as an Interested and Affected Party (I&AP) and to obtain details about the project, please submit your name, contact information and interest in the project to:

**Sibongile Hlomuka**  
**Public Participation Consultant**  
**Royal HaskoningDHV**  
**PO Box 867**  
**Gallo Manor, 2052**  
**Johannesburg**

Tel: (011) 798-6429  
Fax: (011) 798 6010  
Email: [sibongile.hlomuka@rhdhv.com](mailto:sibongile.hlomuka@rhdhv.com)



# Koos en Anna kuier in Bosveld

Ria Wells

**LEPHALALE** — Die bekende en geliefde Koos en Anna Prinsloo het verlede week 'n vinnige draai in die Bosveld kom maak. "Ons mense", sê hulle.

Lesers sal onthou dat Koos op 1 Augustus verlede jaar 'n beroerte-aanval gehad het. Hy is vanaf Marapong Hospitaal na Pretoria-Oos Hospitaal se intensiewe sorgeneheid oorgeplaas en later na Unitas. Koos se herstel was van so 'n aard dat hy na die Midstream Hospitaal toe is en daarna na die Frail Care-afdeling waar hy 24 uur versorging ontvang. Anna woon op dieselfde perseel in 'n woonstel waar sy hom daaglik besoek. Oom Koos se spraak is uit die aard van die saak aangetas, maar gelukkig kan hy nog

kommunikeer – hy raak net soms moeg.

Die kuier in die bosveld was Pieter du Toit se insiatief en hy het spesiale toestemming gekry om Koos, Anna en Nomsa, die vriendelike en getroue verpleegster, 'n bietjie 'huis toe' te bring.

Toe hulle die nuus kry dat hulle bosveld toe kom het 'n opgewonde Koos gesê: "Ek is die eerste een wat klim!" Pieter het ook vir Koos getraakteer met 'n vinnige besoek aan 'n wildplaas in Botswana.

Anna het Donderdag 18 April verjaar en dit was die ideale geleentheid vir die vriendinne om haar 78ste saam met haar te vier.

Koos en Anna sal altyd in die mense wat hulle goed ken se harte bly. Anna, onderwyseres van beroep, het vir jare

as administratiewe beampte by die Hoërskool Ellisras gewerk. Bekwaam, stylvol, netjies en vriendelik. Koos kan beskou word as een van die ware ikone van Ellisras. Hy was vir 26 jaar die hoof van Laerskool Ellisras, was burgemeester, is beskermheer van die Bosveldfees waarvan hy een van die stigters was, hoofouderling in die Hervormde Kerk Ebenhaeser en het op die beheeriggaam van die Lephalale VOO Kollege gedien. 'n Strategie en mediator van formaat wat diep spore in

die gemeenskap getrap het en met sy wye kennis beslis nie bang was om sy oortuigings uit te spreek nie.

Anna en Koos bedank die wonderlike gemeenskap van Ellisras wat hulle die afgelope nege maande deur hulle swaarkry gedra het deur besoeke, oproepe, boodskappe van bemoediging, liefde en gebede. "Dit wat Koos in die gemeenskap gedoen het, kry hy dubbel en dwars in goedheid terug", sê Anna.

Mogol Pos wens julle alles wat mooi is toe.



Koos, Anna en Nomsa net voordat hulle sou terugkeer na Pretoria

(Foto's Mogol Pos)

## McCarthy Volkswagen Witbank

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**078 309 2489**

### NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND WASTE MANAGEMENT LICENSE APPLICATION FOR THE PROPOSED CONTINUOUS ASH DISPOSAL FACILITY FOR THE MATIMBA POWER STATION IN LEPHALALE, LIMPOPO PROVINCE. (DEA REF: 14/12/16/3/3/3/56)

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- Royal HaskoningDHV website  
(www.rhdhv.co.za/pages/services/environmental/current-projects.php)
- Eskom Holdings SOC (Ltd) website (www.eskom.co.za/eia)

#### WHO SHOULD YOU CONTACT?

Royal HaskoningDHV (RHDHV) is the appointed service provider by Eskom to provide independent Environmental Assessment Practitioner (EAP) services for undertaking the required Environmental Impact Assessment and Public Participation (PP) process for the project. To register as an Interested and Affected Party (I&AP) and to obtain details about the project, please submit your name, contact information and interest in the project to:

Sibongile Hlomuka  
Public Participation Consultant  
Royal HaskoningDHV  
PO Box 867  
Gallo Manor, 2052  
Johannesburg

Tel : 011 798 6429  
Fax : 011 798 6010  
Email : sibongile.hlomuka@rhdhv.com



**Royal HaskoningDHV**  
Enhancing Society Together

## In Memoriam

### Corrie Sauer

† 26 November 1919 – 17 April 2013



Corrie Sauer is op 26 November 1919 in die Soutpan-omgewing gebore. Sy het deur al die jare in die Steenbokpan-omgewing gewoon en later jare by haar oudste dogter in Potgietersrus.

Vanaf September 2012 was sy in die ouetehuis waar sy op 17 April 2013 oorlede is.

Ons is baie dankbaar vir alles wat sy vir ons gedoen en beteken het. "Ma was 'n wonderlike mens en 'n staatsmaker. Ons gaan jou baie mis."

— Kinders en kleinkinders

## Solidariteit Helpende Hand Gholfdag

Ten bate van die Vaalwater/Lephalale Beursfonds\*

**11 Mei 2013**  
**Mogol Golfbaan Lephalale**  
**"Better ball selective drive"**

Ons noel maatskappye om 2 spanne van 2 spelers in te skryf vir R1 200! Borgskappe baie welkom. Help die beurs groei vir ons jongmense!

Kontak: Retha by 082 782 4205 of Deon by 078 802 0343 vir enige verdere inligting.

U kan ook epos aan: info@chacmasafari.co.za of deonv@solidariteit.co.za

\*Fonds wat gedurende die dag ingesamel word gaan na die Vaalwater/Lephalale Beursfonds wat jongmense van Vaalwater en Lephalale die geleentheid sal gee om naskool verbonde studeer, by Universiteit, Technikon, Akademie, ens.  
Enige kind kan aansoek doen vir 'n beurs / studietoelating en aansoek sal dan deur 'n komitee van ons eie bestuurslede lesame met hoofkantoor volgens 'n kriterium ge-evalueer word en daarvolgens die beurs toegestaan.

**APPENDIX G**  
**MAP OF SITE ALTERNATIVES**

# Legend

-  Rivers
-  Roads
-  Railway Line
-  Power Line (single)
-  Existing Ash Dump
-  Land Parcels
-  Site Alternatives
-  8km Study Area

