Report No: [5107A/105684]

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS: PROPOSED BRINE AND GROUNDWATER TREATMENT WORKS AT TUTUKA POWER STATION, MPUMALANGA

FINAL SCOPING REPORT

April 2010

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PROJECT DETAILS

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TITLE	FINAL SCOPING REPORT
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CLIENT	Eskom Holdings (Pty) Ltd (Generation Division)
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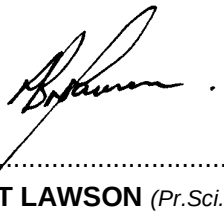

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GLOSSARY OF TERMS

Brine	Water saturated with or containing large amounts of a salt, especially sodium chloride.
Environment	The surroundings (biophysical, social and economic) within which humans exist and that are made up of i. the land, water and atmosphere of the earth; ii. micro organisms, plant and animal life; iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing;
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action.
Environmental Impact Report Assessment (EIAR)	A report assessing the potential significant impacts as identified during the Scoping phase.
Environmental impact	An environmental change caused by some human act.
Environmental Management Programme (EMP)	A document that provides procedures for mitigating and monitoring environmental impacts, during the construction, operation and decommissioning phases.
Public Participation Process	A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development
Reject	Water saturated with or containing large amounts of a salt, especially sodium chloride, as defined above in the "brine" definition. For the purposes of this project, "reject" is considered to be synonymous with "brine".
Scoping	A procedure for determining the extent of and approach to an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined in detail
Scoping Report	A report describing the issues identified

ABBREVIATIONS

BID	Background Information Document
CRR	Comments and Response Report
DARDLA	Department of Agriculture Rural Development and Land Administration
DEA	Department of Environmental Affairs (previously Department of Environmental Affairs and Tourism)
DEAT	Department of Environmental Affairs and Tourism
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EAPSA	Environmental Assessment Practitioner of South Africa
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
FSR	Final Scoping Report
GA	General Authorisation
GN	Government Notice
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWULA	Integrated Water Use License Application
MBCP	Mpumalanga Biodiversity Conservation Plan
Ml	Megalitres

NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NEMWA	National Environmental Management: Waste Act (No. 59 of 2008)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
PES	Present Ecological Status
RO	Reverse osmosis
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
ToR	Terms of Reference
WWTW	Wastewater treatment works

1 INTRODUCTION AND BACKGROUND

The purpose of this Chapter is to introduce the project and describe the relevant legal framework within which the project takes place. Other applicable policies and guidelines are also discussed. The Terms of Reference, scope of and approach to the Environmental Impact Assessment are described and assumptions and limitations are stated.

1.1 INTRODUCTION

Eskom is proposing to construct additional infrastructure at the existing Tutuka power station, approximately 22 km north east of Standerton, Mpumalanga Province, for the treatment of groundwater and wastewater. The treatment facilities would consist of two components; namely upgrading the existing reverse osmosis (RO) treatment plant to include an additional brine (hereinafter referred to as reject) concentration plant and the construction of groundwater treatment works.

This Environmental Impact Assessment (EIA) is for the proposed construction of the reject concentration plant at the existing RO plant and construction of the groundwater treatment works, and associated infrastructure, at the Tutuka power station. The associated infrastructure would include boreholes and pipelines from the ash dump area and potentially other sources of groundwater pollution to the RO plant at the power station as well as from the proposed reject concentration plant to the New Denmark Colliery (along an existing servitude), located approximately 5 km to the north west of the power station.

The proposed additional reject concentration plant would be situated within the power station precinct, adjacent to the existing RO plant (see **Figure 1.1**). The groundwater treatment works would be located on a rehabilitated portion of the ash dump (see **Figure 1.1**), which is to the east of the power station precinct.

In terms of the National Environmental Management Act (No. 107 of 1998) (as amended) (NEMA), the proposed development triggers a suite of activities, which require authorisation from the competent environmental authority before they can be undertaken.

Furthermore, the National Environmental Management: Waste Act (No. 59 of 2008) (NEMWA) provides various measures for the prevention of pollution and ecological degradation, as well as for ecologically sustainable development in order to protect human health and the environment. In this regard, NEMWA identifies and lists certain activities which require environmental authorisation through the NEMA EIA and waste management licencing processes, prior to commencement of those activities.

As this proposed project triggers a number of listed activities in terms of NEMA and NEMWA, it accordingly requires environmental authorisation and a waste management licence. Since Eskom is a state-owned enterprise, the competent authority is the national Department of Environmental Affairs (DEA). DEA's decision will be based on the outcome of this EIA process.

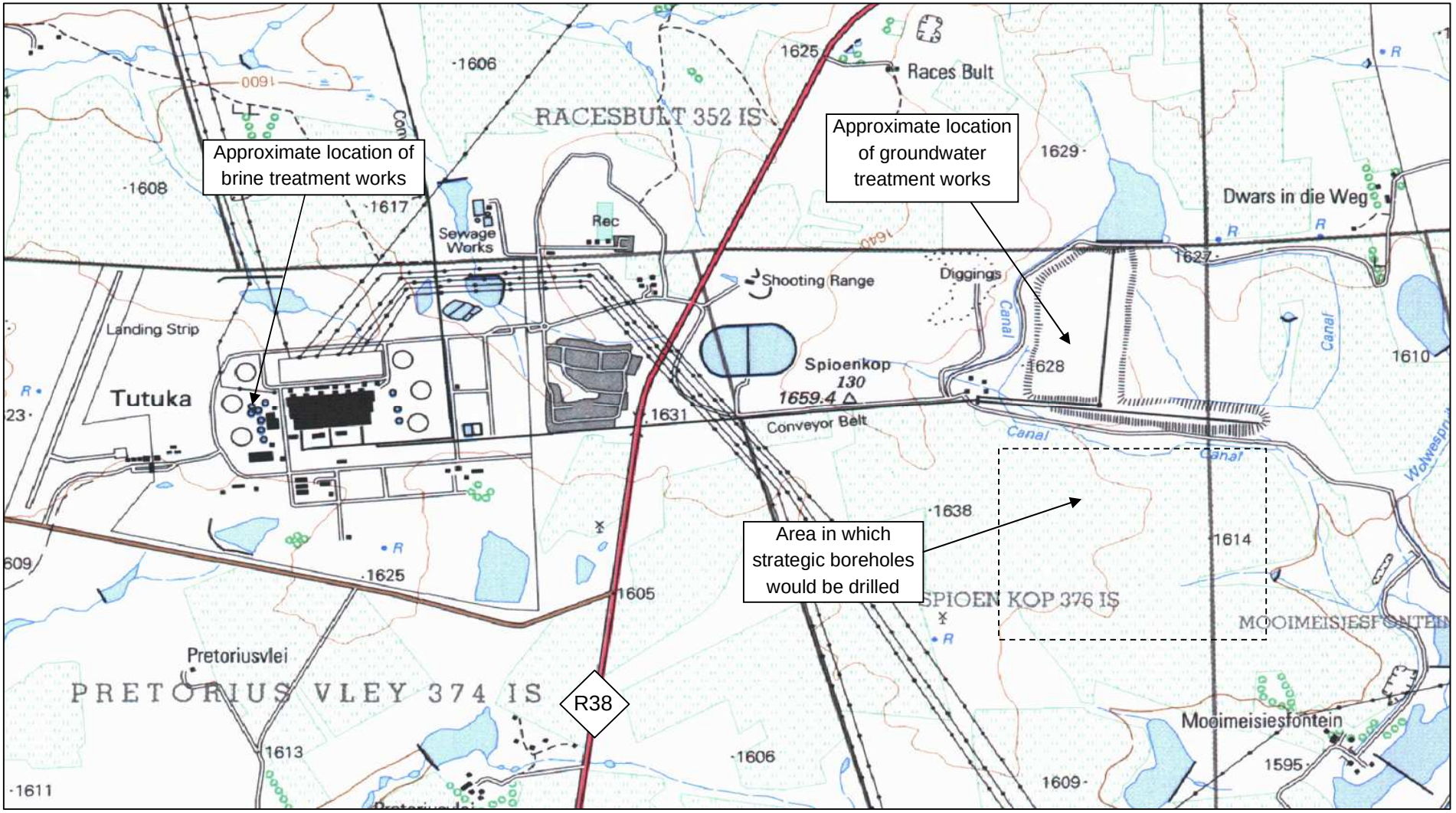

Figure 1.1 Location of the Tutuka power station and proposed treatment facilities (2629 CD)

This report serves to document the Scoping Phase of the EA process (the EIA process and sequence of documents produced as a result of the process are illustrated in **Figure 1.2**).

The EIA process will integrate the requirements for both the environmental authorisation and waste management licensing, in order to obtain a streamlined decision-making process.

The purpose of this Scoping Report[1] is to provide the background and outline the scope of work proposed to be undertaken in the EIA Report (EIAR) phase. Accordingly, the Scoping Report:

- Outlines the legal and policy framework;
- Describes the proposed project and its alternatives;
- Describes the Public Participation Process undertaken to date;
- Describes the biophysical and socio-economic context;
- Describes the range of alternatives that require further investigation in the EIA Phase.
- Identifies potential impacts, including cumulative impacts, that will be assessed in the EIA Phase, inclusive of specialist studies that will be undertaken; and
- Details the assessment methodology that will be adopted for the project.

1.2 LEGAL REQUIREMENTS

1.2.1 National Environmental Management Act, No. 107 of 1998

NEMA, as amended, establishes the principles for decision-making on matters affecting the environment. Section 2 sets out the National Environmental Management Principles which apply to the actions of organs of state that may significantly affect the environment. Furthermore, Section 28(1) 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.

Eskom has the responsibility to ensure that the proposed activity as well as the EIA process conforms to the principles of NEMA. In developing the EIA process, Aurecon has been cognisant of this need, and accordingly the EA process has been undertaken in terms of NEMA and the EIA Regulations promulgated on 21 April 2006[2].

In terms of the EIA regulations, certain activities are identified, which require authorisation from the competent environmental authority, in this case DEA, before commencing. Listed activities in Government Notice (GN) No. 387 require Scoping and EIA whilst those in GN No. 386 require Basic Assessment (unless they are being assessed under an EIA process). The activities being applied for in this EIA process are listed in **Table 1.1**.

[1] Section 29 of Regulation 385 of NEMA lists the content required in a Scoping Report.
[2] GN No. R 385, R 386 and R 387 in Government Gazette No 28753 of 21 April 2006.

Table 1.1 Listed activities in terms of NEMA GN No. R387 and R386, April 2006, to be authorised for the proposed treatment works

NO.	LISTED ACTIVITY
GN No. R387, April 2006	
1(e)	The construction of facilities or infrastructure, including associated structures or infrastructure, for- any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R. 386 of 2006;
GN No. R386, April 2006	
1	The construction of facilities or infrastructure, including associated structures or infrastructure, for-
	k) the bulk transportation of sewage and water, including storm water, in pipelines with – (i) an internal diameter of 0.36 metres or more; or (ii) a peak throughput of 120 litres per second or more;
	m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including – (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.
13	The abstraction of groundwater at a volume where any general authorization issued in terms of the National Water Act, 1998 (Act No. 36 of 1998) will be exceeded;

The Minister of Environmental Affairs and Tourism published proposed amendments to the EIA Regulations under NEMA (the "Draft EIA Regulations") on 13 February 2009, for public comment. The proposed amendments contained in the Draft EIA Regulations which deal with amendments to the listed activities for which environmental authorisation is required, were published in three sets of notices (GN R.166, GN R.167 and GN R.168 in *Government Gazette 31885* of 13 February 2009). It is expected that the proposed amendments to the NEMA EIA regulations will be promulgated in early 2010. Consequently, it is deemed prudent to consider the amended listed activities, to ensure that the scope of the current EIA process is broad enough to include both the current and potentially future listed activities. Consequently the following activity which appear in GN R.166 and GN R.167 and do not appear in GN R.386 and GN R.387 respectively, would be triggered by the proposed project, as listed in **Table 1.2**.

Table 1.2 Listed activities that may trigger an EIA process in the future, according to the proposed amended NEMA EIA Regulations (GN No. R167 of the Draft EIA Regulations)

No.	Listed Activity
13	Any activity listed in Category B of Schedule 1 to the National Environmental Management: Waste Act, 2008.

Since the proposed project is based in Mpumalanga Province, DEA will work closely with the provincial Department of Agriculture Rural Development and Land Administration (DARDLA)[3], to ensure that the provincial environmental concerns are specifically identified and addressed.

Further information on the EIA approach is provided in **Section 1.4**.

1.2.2 National Environmental Management: Waste Act, No. 59 of 2008

NEMWA seeks to reform the law on waste management by making provision for various measures for the prevention of pollution and ecological degradation, as well as ecologically sustainable development in order to protect health and the environment through waste management,. In this regard, NEMWA provides for national norms and standards for regulating waste management in all spheres of government and provides for the licensing and control of waste management activities, as well as the remediation of contaminated land.

The objectives of NEMWA include minimising the consumption of natural resources; avoiding and minimising the generation of waste; reducing, re-using, recycling and recovering waste; treating and safely disposing of waste as a last resort; promoting and ensuring the effective delivery of waste services; remediating land where contamination presents or may present a significant risk of harm to health or the environment; and achieving integrated waste management reporting and planning.

Generally, the Act seeks to ensure that people are aware of the impact of waste on their health, well-being and the environment and to give effect to the constitutional right in order to secure an environment that is not harmful to one's health or well-being.

The proposed project includes a number of activities listed under NEMWA and therefore a waste management licence is required. The activities in terms of NEMWA, GN No. 718 of 3 July 2009, Category B, being applied for in this EIA process are listed in **Table 1.3**.

[3] Mr Surgeon Marebane from the Mpumalanga Department of Agriculture, Conservation and Environment was initially contacted as the environmental commenting authority. He informed the EAPs that the Department of Agriculture Rural Development and Land Administration would provide the relevant commenting function in this instance.

Table 1.3 Listed activities in terms of NEMWA, GN No. 718 of 3 July 2009, Category B, to be authorised for the proposed treatment works

NO.	LISTED ACTIVITY
GN No. 718, 3 July 2009, Category B	
4	The biological, physical or physico-chemical treatment of hazardous waste at a facility that has the capacity to receive in excess of 500 kg of hazardous waste per day.
5	The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such a facility to treat such waste.
7	The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres or more.
9	The disposal of any quantity of hazardous waste to land.
11	The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity).

1.2.3 National Heritage Resources Act, No. 25 of 1999

In terms of the National Heritage Resources Act (No. 25 of 1999) (NHRA), any person who intends to undertake "*any development … which will change the character of a site exceeding 5000 m^2 in extent*", *"the construction of a road…powerline, pipeline…exceeding 300 m in length"* or *"the rezoning of site larger than 10 000 m^2 in extent…"* must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely the South African Heritage Resources Agency (SAHRA) or the relevant provincial heritage agency. These agencies would in turn indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken.

Section 38(8) of the NHRA specifically excludes the need for a separate HIA where the evaluation of the impact of a development on heritage resources is required in terms of an EIA process. Accordingly, since the impact on heritage resources would be considered as part of the EIA process outlined here, no separate HIA would be required. SAHRA or the relevant provincial heritage agency would review the EIA reports and provide comments to DEA, who would include these in their final environmental decision. However, should a permit be required for the damaging or removal of specific heritage resources, a separate application would have to be submitted to SAHRA or the relevant provincial heritage agency for the approval of such an activity, if Eskom obtains authorisation and makes the decision to pursue the proposed project further.

1.2.4 Other applicable legislation and policies

a) National Water Act, No. 36 of 1998

In terms of Section 21 of the National Water Act (No. 36 of 1998) (NWA), the taking of water from a water resource, storing of water, impounding or diverting the flow of water in a water course, and the disposal of water which contains waste or has been heated through a power generation process are all considered water uses, which in general must be licensed, unless permitted as a Schedule 1 activity, or permissible in terms of a General Authorisation (GA) under Section 39 of the Act.

Schedule 1 activities relate mostly to small scale domestic usage of water and would therefore not be applicable to the proposed project. The disturbance to the bed or banks of a river, which could possibly take place during the construction of some of the linear infrastructure, could also be undertaken in terms of the above-mentioned GA, provided that Eskom meets the conditions of the GA.

Aurecon would apply on behalf of Eskom for the requisite licenses, registrations or GA as part of an Integrated Water Use License Application (IWULA) from the Department of Water Affairs (DWA). Information from the IWULA will be incorporated into the EIA and public participation process where relevant.

b) Guidelines

This EIA process is informed by the series of national Environmental Guidelines[4] where applicable and relevant:

- Integrated Environmental Information Management, Information Series 2: Scoping (Department of Environmental Affairs and Tourism (DEAT), 2002);
- DEAT. 2002. Integrated Environmental Information Management, Information Series 3: Stakeholder Engagement (DEAT, 2002);
- Integrated Environmental Information Management, Information Series 4: Specialist Studies (DEAT, 2002);
- Integrated Environmental Management, Information Series 11: Criteria for determining Alternatives in EIA (DEAT, 2004);
- Integrated Environmental Information Management, Information Series 12: Environmental Management Plans (DEAT, 2004);
- Integrated Environmental Management Guideline Series, Guideline 3: General Guide to the Environmental Impact Assessment Regulations. Unpublished (DEAT, 2005);
- Integrated Environmental Management Guideline Series, Guideline 4: Public Participation, in support of the EIA Regulations. Unpublished (DEAT, 2005); and

[4] Note that these Guidelines have not yet been subjected to the requisite public consultation process as required by Section 74 of R385 of NEMA.

- Integrated Environmental Management Guideline Series, Guideline 7: Detailed Guide to Implementation of the Environmental Impact Assessment Regulations. Unpublished (DEAT, 2007).

1.3 TERMS OF REFERENCE AND SCOPE OF THE EIA

In November 2009, Eskom appointed Aurecon to undertake an EIA process for the proposed construction of a reject and a groundwater treatment works at the Tutuka power station in Mpumalanga. Eskom's Terms of Reference (ToR) for the EIA is included as **Annexure A** of this report Environmental Authorisation and a Waste Management Licence are being sought for the proposed project in terms of NEMA and NEMWA, respectively, and a Water Use Licence is being sought for the proposed project in terms of NWA.

This EIA process specifically excludes the disposal of concentrated reject by the New Denmark Colliery as the colliery will undertake a separate EIA and licensing process for this activity, before the Directive held by the mine expires, or the caverns they are currently disposing the reject into are filled.

1.4 APPROACH TO THE PROJECT

There are three distinct phases in the EIA process, as required in terms of NEMA, namely the Initial Application, the Scoping and EIA Phases. The EIA process is described below and diagrammatically represented in **Figure 1.2**.

To date, the EIA process has unfolded as follows:

- A desktop review of relevant literature, including a review of previous environmental studies in the area, was undertaken. These included, *inter alia*, the following:
  - Gert Sibande District Municipality Spatial Development Framework (SDF)(2009);
  - Gert Sibande District Municipality Integrated Development Plan (IDP) 2009/10 (2009);
  - Lekwa Local Municipality (LM) SDF (2008);
  - Lekwa LM IDP 2009/10 (2009);
  - Vegetation Map of South Africa (Mucina & Rutherford, 2006); and
  - Tutuka Waste Disposal Site: Proposed extension of the existing General Waste Disposal Site (and associated infrastructure) at the Tutuka power station. Draft Scoping Report. (Zitholele Consulting, 2009).
- Submission of an EIA Application Form and two Waste Management Licence application forms to notify DEA of the project, submitted on 17 December 2009. This represents the Initial Application Phase of the EIA process. Acknowledgement of receipts of the EIA Application Form and of the Waste Management Licence forms was received from DEA (Environmental Impact Management) and DEA (Authorisations and Waste Disposal Management) on 10 February 2010.

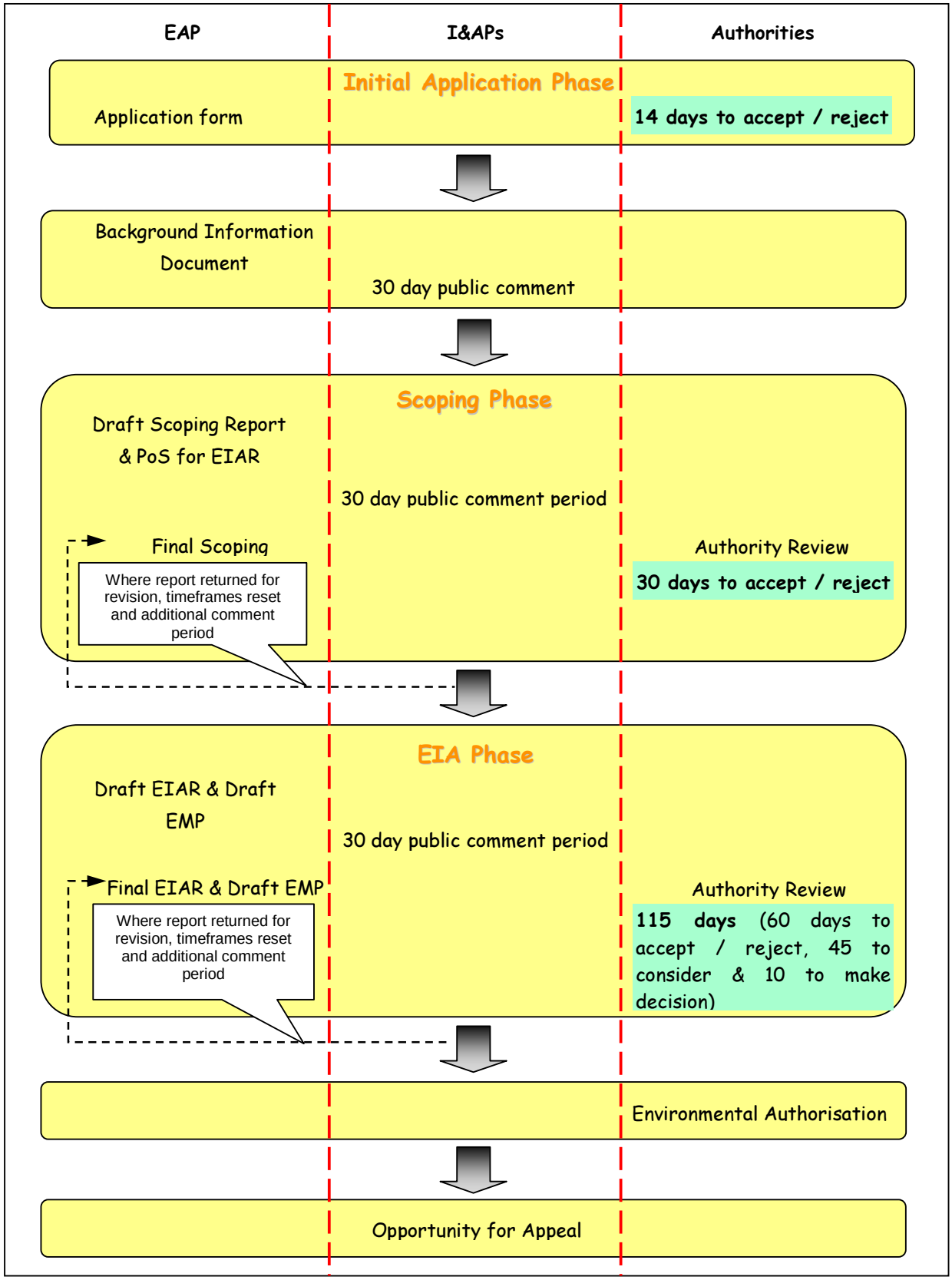

Figure 1.2 The EIA process in terms of NEMA

The Application Form, Waste Management Licence forms and DEA's letters of acknowledgement are included in **Annexure B**;

- Distribution of the Background Information Document (BID) (included in **Annexure C**) on 26 January 2010 to inform Interested and Affected Parties (I&APs) of the project and to invite I&APs to register on the database;
- Advertisements were placed in a suite of national, regional and local newspapers notifying the broader public of the initiation of the EIA and inviting them to register as I&APs from 29 January 2010 (the advertisements are included in **Annexure C**); and
- A site notice was erected at the east and west security entrances and at the ash disposal entrance at Tutuka power station on 9 February 2010 (the site notices are included in **Annexure C**).

This report covers the second phase of the EIA process, namely the Scoping Phase. The Scoping Phase will be followed by the EIA Phase, which will culminate in a comprehensive document, the EIAR.

Scoping is defined as a procedure for determining the extent of and approach to the EIA Phase and involves the following key tasks:

- Involvement of relevant authorities and I&APs;
- Identification and selection of feasible alternatives to be taken through to the EIA Phase;
- Identification of significant issues/impacts associated with each alternative to be examined in the EIAR; and
- Determination of specific ToR for the specialist studies required in the EIAR (Plan of Study for EIA).

1.4.1 The Scoping Phase

An inception field trip was held on 8 December 2009 with the EIA team, the IWULA team and the client body. The purpose of the field trip was to facilitate an understanding of the key aspects such as:

- Biophysical issues:
  - Terrestrial and aquatic fauna and flora;
  - Groundwater aspects; and
  - Visual aspects.
- Social issues:
  - Heritage issues; and
  - Location of local communities.
- Construction phase issues.

The information gathered from the site visit was used in refining the ToR for the EIA process and the specialist studies to be undertaken during the EIA Phase.

Consultation with the public forms an integral component of this investigation and enables I&APs, e.g. directly affected landowners, national, provincial and local authorities,

environmental groups, civic associations and communities, to identify their issues and concerns, relating to the proposed activities, which they feel should be addressed in the EIA process. A detailed summary of the public participation process, and the issues and concerns raised by the various I&APs is provided in **Chapter 3**.

1.4.2 Authority involvement

The Application Form and Waste Management Licence forms were submitted to DEA on 17 December 2009 (refer to **Annexure B**). The BID was also sent to a number of authorities for comment, namely:

- Lekwa Local Municipality;
- Gert Sibande District Municipality;
- South African Heritage Resources Agency;
- Mpumalanga Department of Economic Development, Environment and Tourism;
- DARDLA; and
- DWA.

DEA acknowledged the Application Form and Waste Management Licence forms on 10 February 2010 (refer to **Annexure B** for a copy of the letters of acknowledgement).

1.4.3 Decision making

Once the Final Scoping Report has been completed, with all I&AP comments incorporated into the Comments and Response Report (CRR), it will be submitted to DEA for review. The competent authority must, within 30 days of receipt of the Scoping Report, in writing –

(a) Accept the report and Plan of Study for EIA contained in the report and advise the Environmental Assessment Practitioner (EAP) to proceed with the tasks contemplated in the Plan of Study for EIA, or

(b) Request the EAP to make such amendments to the report or the Plan of Study for EIA as the component authority may require, or

(c) Reject the Scoping Report or Plan of Study for EIA if it

  (i) Does not contain material information required in terms of these regulations, or

  (ii) Has not taken into account guidelines applicable in respect of Scoping Reports and Plans of Study for EIA.

1.5 ASSUMPTIONS AND LIMITATIONS

1.5.1 Assumptions

In undertaking this investigation and compiling the Scoping Report, the following has been assumed:

- The strategic level investigations undertaken by Eskom prior to the commencement of the EIA process are technologically acceptable and robust.
- The information provided by the applicant and specialists is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the proposed expansion of the reject concentration plant and the proposed groundwater treatment works and their associated infrastructure. The project does not include infrastructure required by the New Denmark Colliery to deal with the concentrated reject received from the Tutuka power station.

1.5.2 Gaps in knowledge

This Scoping Report has identified the potential environmental impacts associated with the proposed activities. However, the scope of impacts presented in this report could change, should new information become available during the EIA Phase. The purpose of this section is therefore to highlight gaps in knowledge when the Scoping phase of the project was undertaken.

- The planning for the proposed treatment facilities is at a feasibility level and therefore some of the specific details are not available at this stage of the EIA process. This EIA process forms a part of the suite of feasibility studies, and as these studies progress, more information will become available to inform the EIA process. This will require the various authorities, and especially DEA, to issue their comments and ultimately their environmental decision to allow for the type of refinements that typically occur during these feasibility studies and detailed design phase of projects. Undertaking the EIA process in parallel with the feasibility study does however have a number of benefits, such as integrating environmental aspects into the layout and design and therefore ultimately encouraging a more environmentally sensitive and sustainable project.
- The environmental impacts associated with the disposal of concentrated reject by the New Denmark Colliery are not considered as part of this EIA process, as the New Denmark Colliery will undertake a separate EIA process to deal with the process in due course.

1.6 INDEPENDENCE

The requirement for independence of the environmental consultant is aimed at reducing the potential for bias in the environmental process. Neither Aurecon nor any of its sub-consultants

are subsidiaries of Eskom. Furthermore, all these parties do not have any interests in secondary or downstream developments that may arise out of the authorisation of the proposed project.

The Project Director, Mr Brett Lawson and the Project Manager, Mr Ashwin West, are appropriately qualified and registered with the relevant professional bodies. Mr Lawson is a certified Environmental Assessment Practitioner of South Africa (EAPSA), and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. Mr West is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. Consequently Aurecon is bound by the codes of conduct for EAPSA and the South African Council for Natural Scientific Professions. The CV summaries of the key Aurecon staff are included in the Plan of Study for EIA contained in **Chapter 5**.

1.7 STRUCTURE OF THE SCOPING REPORT

Table 1.4 presents the structure of the Scoping report as well as the applicable sections that address the required information in terms of NEMA. Specifically, Section 29 (1) of the EIA Regulations requires that the following information is provided:

Table 1.4 NEMA requirements for Scoping Reports

Section 29(1) of Regulation 385	
(a)	Details of: (i) the EAP who prepared the report; (ii) the expertise of the EAP to carry out Scoping procedures;
(b)	a description of the proposed activity and of any feasible reasonable alternatives that have been identified;
(c)	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;
(d)	a description of the environment that may be affected where 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;
(e)	an identification of all legislation and guidelines that have been considered in the preparation of the Scoping Report;
(f)	a description of environmental issues and potential impacts, including cumulative impacts, that have been identified;
(g)	information on the methodology that will be adopted in assessing the potential impacts that have been identified, including any specialist studies or specialised processes that will be undertaken;
(h)	details of the public participation processes conducted in terms of Regulation 28(a), including; (i) the steps that were taken to notify potentially I&APs of the application; (ii) proof that notice boards, advertisements and notices notifying potentially

	interested and affected parties of the application have been displayed, placed or given; (iii) a list of all persons or organisations that were identified and registered in terms of Regulation 57 as I&APs in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt and response of the EAP to these issues;
(i)	a Plan of Study for EIA 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 EIA 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 processing with the activity; and (iv) particulars of the public participation process that will be conducted during the EIA process; and
(j)	any specific information required by the competent authority.
Section 29(2) of Regulation 385 In addition, a scoping report must take into account any guidelines applicable to the kind of activity which is the subject of the application.	

Section 29 of NEMA regulations explicitly requires specific content to be addressed in the Scoping Report. **Table 1.5** assists the reader to find the relevant section in the report.

Table 1.5 Location of content prescribed by NEMA for Scoping Reports

REGULATION	CONTENT AS REQUIRED BY NEMA	CHAPTER/ANNEXURE	PAGE
29 (1) (a)	EAP and expertise of the EAP	Chapter 5	49
29 (1) (b)	Description of the proposed activity	Chapter 2	15
29 (1) (c)	Description of the property	Chapter 4	31
29 (1) (d)	Description of the environment	Chapter 4	31
29 (1) (e)	Identification of all legislation	Chapter 1, Section 1.2	3
29 (1) (f)	Description of all environmental issues and potential impacts	Chapter 4	31
29 (1) (g)	Information on the methodology	Chapter 5	49
29 (1) (h)	Details of the Public Participation Process	Chapter 3	25
29 (1) (i)	Plan of study for EIA	Chapter 5	49
29 (1) (j)	Additional information		
29 (2)	Guidelines used in the Scoping Report	Section 1.2.4b)	7

2 THE PROPOSED ACTIVITY

This chapter considers the need for the proposed project, briefly outlines the nature of the proposed activities and then considers and screens the various project alternatives in order to focus the EIA Phase on the most feasible alternatives.

2.1 THE NEED FOR THE PROPOSED ACTIVITY

The Eskom Tutuka Power Station is supplied with coal from the New Denmark Colliery, which is operated by Anglo Coal. The coal is mined via an underground mining process, at depths of approximately 200 m below the surface. During the operation of the mine it was discovered that underground water was filling up the mining areas, making the mine inoperable. Consequently, from 1989 onwards, underground mine water from the New Denmark Colliery, as a result of coal mining activities, was sent to the Tutuka power station for treatment, as the power station had the facility to treat the mine water. This was undertaken as a measure to maintain the coal mining operations and ultimately the operation of the power station, as the mine is contractually obliged to supplying coal to the power station.

The underground water is treated via an RO treatment process at a rate of 22.4 megalitres (Ml)/day (16.4 Ml consists of mine water and 6 Ml consists of cooling water from the power station). The treated water is split into two streams, namely a clean stream and a reject stream (referred to as the reject stream). The reject stream accounts for some 13.4 % of the water (3.0 Ml of 22.4 Ml per day). Of the 3.0 Ml of reject produced per day, 1.07 Ml is utilised on the ash dump for dust suppression, 0.54 Ml is evaporated in the power station's boilers 1, 2 and 3 and the remaining 0.89 Ml is returned to the mine (see **Figure 2.1**). An additional 0.50 Ml/day is further concentrated through an evaporator concentration plant. The condensate (0.36 Ml/day) is returned to the cooling water as make up and the reject (0.14 Ml/day) is disposed of in the fly ash conditioning system.

The volume of reject used for dust suppression currently exceeds the optimal volume for dust suppression. When more wastewater is applied on the ash than what is evaporated, the field capacity is exceeded. This implies a flow of water through the ash which carries pollutants towards the groundwater. Consequently, continued disposal of reject on the ash dump is no longer considered to be a feasible solution, as it appears to result in the generation of leachate, causing groundwater pollution.

Some of the excess reject has been evaporated in three of the six boilers (boilers 1, 2 and 3). Eskom commenced with the evaporation of reject in 2003 in one boiler and, once it had been determined that the evaporation of reject did not affect the efficiency of the boiler, the activity was expanded to two further boilers. During the evaporation process, reject is injected at the bottom of the boiler, below the level where the pulverised fuel is injected and ignited, where temperatures are cooler (about 650℃, compared to b etween 1 300℃ and 1 700℃ higher in the boiler where combustion occurs) to prevent volatilisation of the salts. The reject is evaporated at a rate of 10 - 14 m^3/hour per unit or an average of 0.54 Ml/day, up to a maximum volume of

some 1 Ml per day. Evaporation is conducted continuously when the unit is operating at a load of greater than 380 MW.

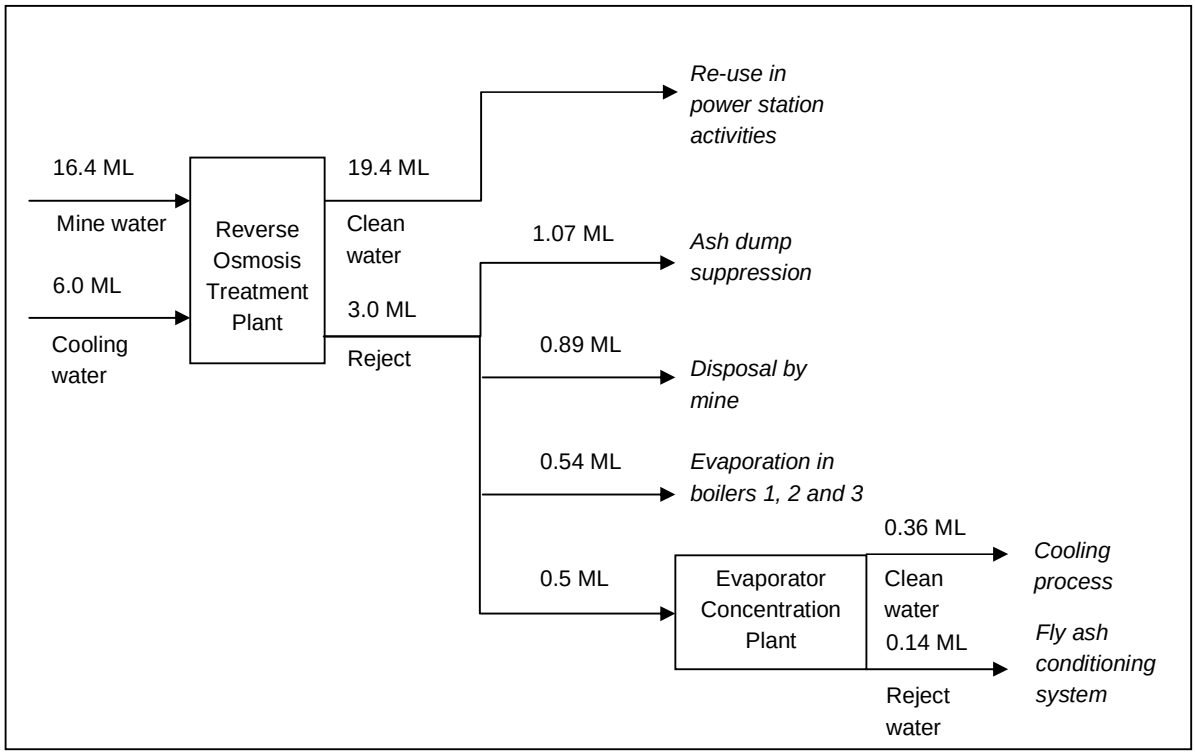

Figure 2.1 Process flow diagram of daily reject treatment and disposal

The remaining 0.89 Ml of reject, not evaporated or used for dust suppression, is returned to the New Denmark Colliery where it is stored in mined caverns. The 240 m deep caverns used for the storage of reject are located in impermeable rock so that there is less risk of groundwater contamination. The mine holds a Directive for the disposal of the reject (see **Annexure D**) in this manner. However, the current storage volume is diminishing. The mine will therefore be applying for a new licence, in terms of NEMWA and DWA, in due course, for the disposal of the reject.

As noted above, reject water is currently used for irrigation of the ash dump for the purposes of dust suppression. The volume of reject used for irrigation (1.07 Ml per day) exceeds the carrying capacity of the ash dump, resulting in the generation of leachate, which has historically been penetrating the groundwater resource, potentially leading to pollution of the resource. Consequently, Eskom is proposing to abstract the polluted groundwater, undertake initial removals of metals from the groundwater at the ash dump in a new waste water treatment plant, and then pump the water to the RO plant for further treatment, including reject concentration in the proposed expanded reject concentration plant. The recovered groundwater would be used on site to supplement the power station's water needs, which would ultimately reduce its requirement for raw water from the Grootdraai Dam.

Consequently, Eskom is proposing the expansion of the reject concentration plant and a groundwater treatment plant at the power station to process the polluted groundwater and further concentrate the reject, which would then be returned to the mine for disposal.

2.2 DESCRIPTION OF THE PROPOSED ACTIVITY

Eskom's Tutuka power station proposes to upgrade its RO plant through construction of an additional reject concentration plant, within the power station precinct, the construction of a new groundwater treatment plant at the ash dump and associated pipeline network from other sources of groundwater pollution (if required). The project requires the following components:

- 3 Ml per day reject concentration plant, adjacent to the existing RO plant;
- A 1 Ml per day groundwater treatment plant, located on a rehabilitated portion of the ash dump, 6 km east of the power station;
- An approximately 6 km long 200 mm internal diameter pipeline to convey groundwater from the groundwater treatment plant to the RO plant at the power station; and
- An approximately 14 km long pipeline to transfer reject water from the reject concentration plant to the New Denmark Colliery, for final disposal. The pipeline would be located within an existing servitude.

Figure 2.2 shows the process flow diagram of the proposed reject treatment and disposal (volumes per day).

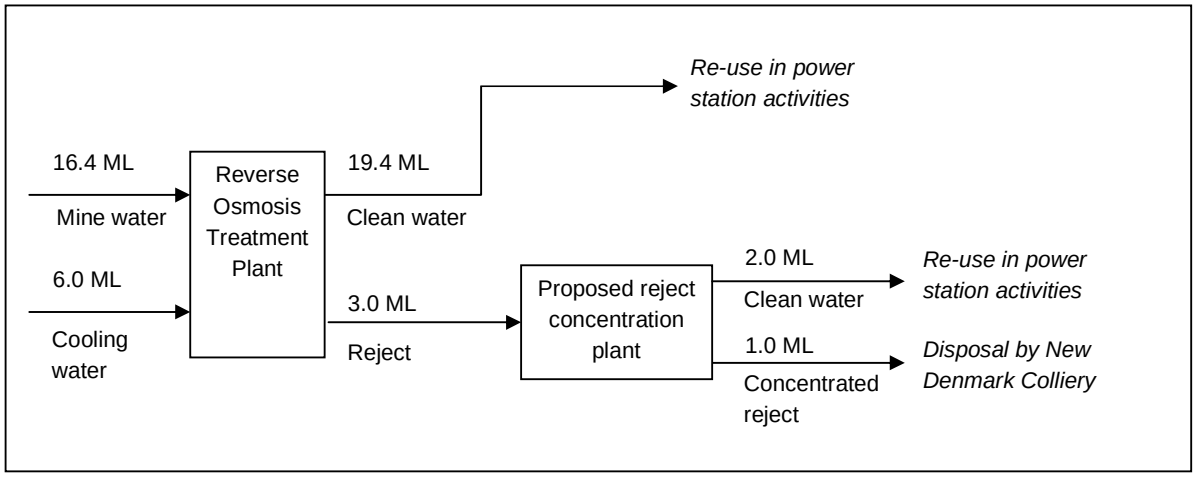

Figure 2.2 Process flow diagram of daily proposed reject treatment and disposal

As an interim measure, Eskom is also proposing the expansion of a reject evaporation process, which currently takes place in boilers 1, 2 and 3, to boilers 4, 5 and 6. No additional infrastructure would be required for this, only minor modifications to the boilers. This would be an interim measure to reduce the volume of water irrigated on the ash dump and returned to the mine, and the activity would cease once the above infrastructure has been installed and is operational. Eskom is consequently applying for an exemption from undertaking an EIA for this proposed reject evaporation expansion activity. This is the subject of a separate process.

Should DEA turn down the application, it is Eskom's intention to include the expansion of the brine evaporation within this EIA and assess the proposed expansion as necessary.

2.3 CONSIDERATION OF ALTERNATIVES

2.3.1 Introduction

NEMA requires that alternatives are considered during the EIA process. An important function of the Scoping Phase is to screen alternatives to derive a list of feasible alternatives that need to be assessed in further detail in the EIA Phase. An alternative can be defined as a possible course of action, in place of another, that would meet the same purpose and need (DEAT, 2004). Alternatives could include, amongst others, the following:

- Activity alternatives – also referred to as project alternatives. Requires a change in the nature of the proposed activity. This category of alternatives is most appropriate at a strategic decision-making level.
- Location alternatives – alternative locations for the entire project proposal or for components of the project proposal.
- Site layout alternatives – Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site.

The above categories of alternatives are the ones most pertinent to this EIA process, and will be explored in detail below. The purpose of this section of the report is to identify (scope) and describe all potential alternatives and determine which alternatives should be carried through to the EIA Phase of the project for further assessment.

2.3.2 Activity alternatives

Fundamentally different alternatives for achieving the project's goal are normally assessed at a strategic level. In this regard, a number of options were investigated to resolve the problem of excess reject and contamination of groundwater, namely: 1) wet-ashing, 2) reject treatment and disposal via ponds (including pre-treatment through brine concentration) and 3) reject treatment through an evaporator/crystalliser plant (Eskom (2008) Tutuka power station Brine Treatment Proposal). These investigations were undertaken by Eskom and Golder and Associates in conjunction with Anglo Coal.

a) Reject treatment alternatives

Option 1 – Wet Ashing

Option 1 proposed the implementation of a wet ashing facility by the power station, as opposed to the existing dry ashing facility. It was thought that the high pH of a wet ash facility would prevent leaching of heavy metals into the groundwater and the use of reject to achieve the required slurry ratios with the ash would resolve the problem of the excess reject. A wet ashing facility would require a lined ash slurry dam and a lined

return water dam (the existing dirty water dam would be used). In wet ashing, dam walls are constructed from earth initially, and later ash. Ash slurry is then poured into the dam, where the ash settles out. Water is removed from the surface of the dam and piped to the return water dam. Water which seeps through the dam is collected by a leachate system and piped to the return water dam. As the dam becomes shallower due to ash deposition the walls are raised to contain the incoming ash slurry. This continues until the dam reaches its maximum height. The return water dam would also require a lining with leachate collection and leakage detection.

Additional raw water (of 420 750 m^3/year (on average) would be required to produce the recommended slurry ratio. This additional raw water is additional to the excess brine water of 1 095 000 m^3/year.

Option 2 – Evaporation Ponds

Option 2 focused on reject pre-treatment and the use of evaporation ponds to evaporate and store reject. This entails the pre-treatment of reject in a secondary desalination process (for volume reduction purposes) before disposal in reject ponds. A number of sub-options were investigated:

- A- One large pond, sized to evaporate all reject;
- B- Phased implementation, where ponds are sized for evaporation and storage;
- C- Enhanced evaporation; and
- D- Forced evaporation for further reject reduction before disposal in ponds.

The feasibility of a reject treatment plant to reduce the volume of reject, from the current 3 Ml/day to 1 Ml/day, through a secondary desalination process (additional reject concentration plant) was also investigated for the above sub-options in Option 2, and found to be feasible.

Reject pond sizes ranged from 502 ha to 29 ha for the various sub-options identified. The larger pond sizes were not practical due to space considerations. However the smaller ponds as required for sub-options B, C and D could be located on Eskom property and hence were considered feasible. The liner system required for the ponds would include a primary liner with a leakage collection system, a secondary liner with a leakage detection system and a sub-surface drainage collection system.

The lowest cost option for the reject pond options was where volume reduction of the reject through a secondary treatment plant took place, with reject disposal in phased ponds.

Option 3 – Reject Evaporator/Crystalliser

Option 3 considered reject pre-treatment including an evaporator/crystalliser. The pre-treatment of reject would be as discussed in Option 2 with a resultant volume of 1 Ml of reject per day. This would be evaporated in a process whereby 80 % of the water is recovered and the remaining 0.2 Ml/day would then be crystallised. Approximately 53 tons of salt would be produced per day by this process, for disposal at the Tutuka power station (a new hazardous waste site would be required) or at the Holfontein Dump.

Option 4 – "No-go" alternative

In terms of the EIA Regulations GN. No. R385 of 21 April 2006, the option of not proceeding with a proposed activity must be considered as an alternative. As such the "no-go" alternative forms Option 4. In the "no-go" alternative, reject would continue to be irrigated on the ash dump with the resultant over-irrigation and hence potentially the continuing pollution of the groundwater below the ash dump. Alternatively Eskom could return all 3 Ml per day of the reject to the colliery after treatment in its existing RO. The cavern in which the colliery is disposing of the reject would reach capacity sooner than expected. Should the colliery continue to dispose of the reject in the cavern, it would overflow and force the mine to shut down operations. Alternatively the colliery would have to shut down operation to stop the production of reject which it is unable to dispose of. As the colliery provides for 60 % of the coal requirements of Tutuka power station, the power station would also have to run at reduced capacity (i.e. at 40 %) relying on imported coal only. Alternatively Eskom would need to increase the volume of imported coal, which may be challenging, given that coal mines are typically engaged in long term supply contracts with customers, and would probably not be able to supply coal to a new customer at short notice.

Conclusions

The comparison of the first three options showed that the cost of the wet ashing option was very high, due to the requirement for a liner system. Furthermore, it would not be logical for the power station to change ashing technology as the dry ashing plant have been maximised for operational efficiency. Dry ashing plant (e.g. conveyor belts), would have to be modified or replaced to allow for wet ashing. The reject treatment with four phased evaporation ponds (Option 2B) was considered to be the most viable option. The lifecycle cost analysis confers its economic feasibility when compared with the other options investigated. The pre-treatment was considered to be essential to reduce the scaling potential of the reject, with a recovery of 66 %.

Eskom and New Denmark Colliery are intricately linked by coal as well as treatment and disposal of reject. As such both parties agreed to take a portion of the responsibility for the reject treatment and disposal. Eskom has traditionally treated the underground polluted coal mine water, whilst New Denmark Colliery has traditionally disposed of the concentrated reject. After investigation of the options described above it was agreed by the two parties (Eskom and the coal mine) that Eskom would continue treating the polluted underground coal mine water, and would take on the responsibility for a second reject concentration process. New Denmark Colliery would continue to take responsibility for the disposal of the reject by further investigating the options described above and implementing the preferred option, as.

As such only the proposed concentration of reject (Option 2B) will be assessed in the EIAR. As it is statutorily required that the "no-go" alternative be considered, it will also be assessed in the EIAR.

Preferred reject treatment alternative (Option 2B)

The proposed reject treatment plant would consist of pre-treatment, filtration and high pressure secondary desalination to achieve maximum recovery of the reject (see **Figure** 2.3).

The pre-treatment would involve a softening process whereby scale-forming compounds would be removed from the reject to allow the reject to be processed through the high pressure desalination step. The sludge/precipitate from this process would be discharged to the existing clarifier sludge blowdown sumps at the water treatment plant.

The softened reject would then be neutralized with sulphuric acid and an anti-scalant added. The reject would then be processed through ultrafiltration membranes to remove suspended solids. Provision would be made for cleaning-in-place in order to ensure the membranes remain clean of foulants.

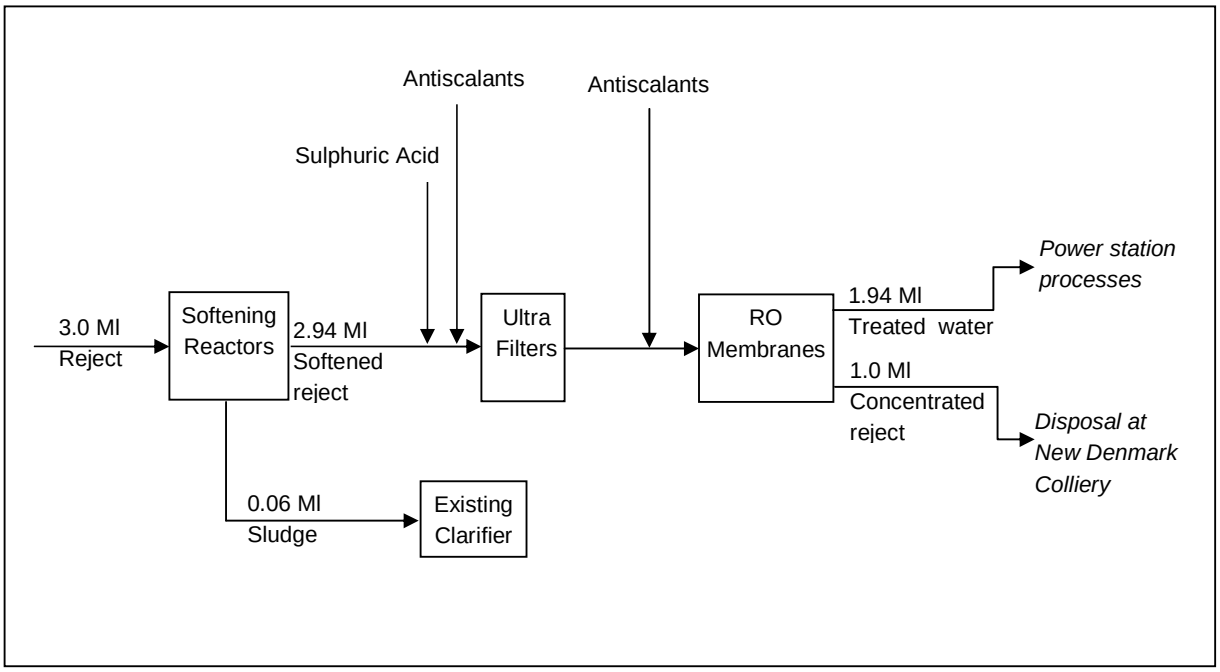

Figure 2.3 Process flow diagram of the proposed reject treatment plant (volume per day)

The ultrafiltered product would then be dosed with an anti-scalant to limit scaling on the RO membranes. The product would then be processed through RO membranes at high pressure. The RO membranes would be of the high rejection sea water type.

The treated water obtained from this process would be of a good quality and would be used in the power station processes such as for cooling water. The high concentration reject which is produced would be piped to New Denmark Colliery for disposal.

A minimum of 66 % (or 1.94 Ml/day) recovery is expected from the reject concentration plant, but this could increase to as high as 85 %, dependent on the appointed supplier. A higher recovery rate would result in less concentrated brine and greater recovery of clean water.

Continuous on-line analytical equipment would be installed to ensure efficient operation of the process.

b) Groundwater pollution treatment alternatives

Option 1 – Proposed groundwater treatment plant

The proposed groundwater treatment plant would involve the drilling of boreholes, installation of pumps and pipelines to abstract the groundwater and the reduction process for conversion of the heavy metals to their stable, non-toxic isotopes (see **Figure 2.4**).

For the reduction and precipitation of heavy metals, the predominant heavy metal requiring removal is chromium 6. The process would reduce chromium 6 to chromium 3, using a suitable reducing agent and the necessary pH conditions for the reaction to occur. After reduction, the heavy metals would be precipitated with the use of suitable precipitating aids (flocculants) and the precipitate/sludge settled out in a clarifier.

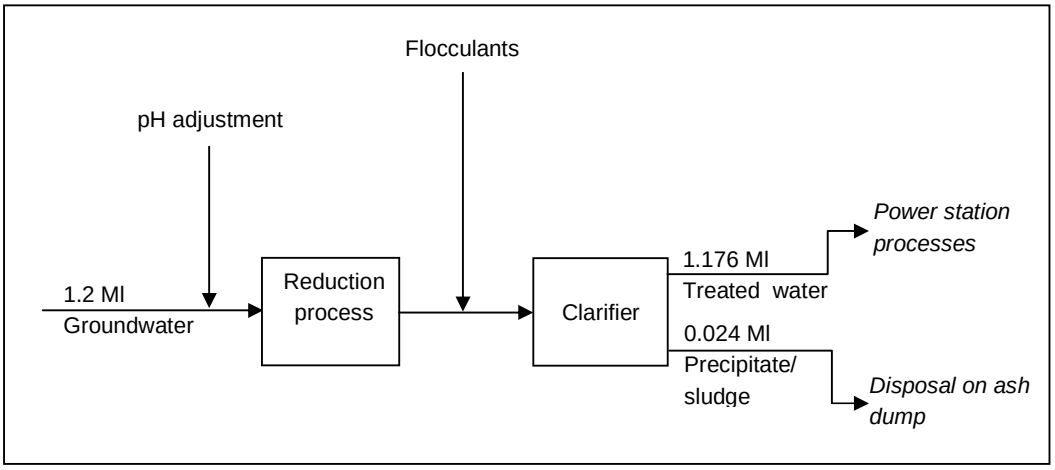

Figure 2.4 Process flow diagram of the proposed groundwater treatment plant (volume per day)

The precipitate/sludge from the process would be disposed of on the ash dump. The sludge would contain the reduced stable, inert heavy metals. The recovered water would be pumped to the power station for further treatment in the existing RO plant. The treated water would then be used in the power station processes such as for cooling water.

Option 2 – "No-go" alternative

As described previously above, assessment of the "no-go" alternative is statutorily required and therefore constitutes Option 2 in this context. In this alternative polluted groundwater would not be abstracted and treated with the potential expansion and migration of pollution plume to downstream groundwater users.

Conclusions

Both the proposed groundwater treatment plant and the "no-go" alternative will be assessed in the EIAR.

2.3.3 Site location alternatives

Once the need for the proposed reject and groundwater treatment works had been established, Eskom considered the location of the proposed works. It was noted that the most economically feasible location for the treatment works would be near to the source of their respective feed streams. As such Eskom has proposed three site alternatives for the proposed reject treatment works, near to the existing RO works within the power station precinct (see **Figure 2.5** and **Figure 2.6**). All these areas have been disturbed (i.e. are not in a natural state) by the construction of the power station and its infrastructure, and are brownfield sites. The proposed reject treatment works consists of two components, namely a pre-treatment facility and a treatment works component. The treatment works component would be adjacent to the existing RO process in each of the three location alternatives. The pre-treatment facility would be located on one of three locations between the existing RO and the north eastern cooling towers.

Figure 2.5 Location alternative for the proposed reject treatment works, immediately adjacent to existing RO process (08/12/09)

Figure 2.6 General area of location alternatives 1-3 for the proposed pre-treatment facility of the proposed reject treatment works, adjacent to cooling towers (08/12/09)

The boreholes for the abstraction of the contaminated groundwater would be required to be situated downstream (south) of the ash dump and the exact location would be determined by the groundwater studies. However, the ash dump would extend in this direction in the future, hence any infrastructure placed in this area would need to be moved in the future. Eskom therefore proposed that the proposed groundwater treatment works be located on a rehabilitated portion of the ash dump (see **Figure 1.1**).

These site location alternatives will be assessed in the EIAR.

2.3.4 Site layout alternatives

Site layouts (one or more) will be developed for the proposed sites. The development of these layouts will be based on *inter alia* the following criteria:

- Technical constraints
  - Spatial orientation requirements of certain plant; and
  - Layout relative to other existing infrastructure, such as power lines and roads.
- Environmental constraints
  - Topographical constraints, including surface and groundwater;
  - Aquatic and terrestrial constraints (presence of wetlands, rivers, protected plant communities); and
  - Aesthetics.

The site layouts will be developed during the EIA Phase, and will be presented and assessed in the Draft EIAR.

2.3.5 Summary of alternatives

To summarise, the feasible alternatives which will be assessed in the EIAR include the following:

- Activity alternatives:
  - Concentration of reject via a reject concentration plant;
  - "No-go" alternative to reject concentration plant;
  - Treatment of polluted groundwater via a groundwater treatment plant; and
  - "No-go" alternative to the groundwater treatment plant.
- Location alternatives:
  - Three locations for the proposed reject plant; and
  - One location for the proposed groundwater plant.
- Site layout alternatives:
  - One layout per location.

3 THE PUBLIC PARTICIPATION PROCESS

The purpose of this Chapter is to provide an outline of the Public Participation Process, a summary of the process undertaken to date, and the way forward with respect to public participation as part of the EIA Phase of this project. This Chapter also provides a summary of the key issues that have been raised to date.

3.1 INTRODUCTION

Consultation with I&APs forms an integral component of an EIA process (see **Figure 1.2**) and enables *inter alia* directly affected landowners, neighbouring landowners, stakeholders, communities and interested parties to identify the issues and concerns relating to the proposed activity, which they feel should be addressed in the process. The approach to this public participation process, summarised in the Plan of Study for EIA (Chapter 5), has taken cognisance of the DEAT Guideline on Stakeholder Engagement (2002).

Public participation, as required in terms of the EIA Regulations can, in general, be separated into the following phases:

Initiation of Public Participation Process
During this phase, I&APs are notified of the initiation of the environmental investigation, to enable them to register as I&APs, and raise issues and concerns at the outset of the investigation.

Comment on Draft and Final Reports
During the Scoping and EIA Phases, registered I&APs are provided with an opportunity to comment on draft and final versions of the reports. This is enabled by the lodging of the reports at suitable locations and invitations to public meetings/open houses to discuss the content of the relevant report.

Decision and Appeal period
This is the final phase of the public participation process. Once the competent authority has made their decision and issued an Environmental Decision, the applicant and I&APs are notified of the decision and have the opportunity to appeal to the national Minister of Water and Environmental Affairs, within the stipulated timeframes.

Progress with respect to these various stages for the current project is discussed in more detail below. It should be noted that the public participation process developed for this investigation meets the minimum requirements of NEMA.

3.2 INITIATION OF PUBLIC PARTICIPATION PROCESS

The approach adopted for the current investigation was to identify as many I&APs as possible initially, through a suite of activities, as follows:

- Placing advertisements in regional and local newspapers;
- Placing notice boards at both site entrances and at the ash dump entrance;
- Providing written notice and a Background Information Document (BID) to potential I&APs including surrounding landowners, organs of state, ward councillors and relevant authorities; and
- Requesting potential I&APs to recommend other potential I&APs to include on the database (chain referral process).

Thereafter, the remainder of the communications will be focused on registered I&APs and on local advertising. Consequently, the initial advertising campaign was broad and thorough and invited the members of the public to register as I&APs.

3.2.1 Compilation of I&AP database

The initial database of I&APs was compiled using a list of stakeholders provided by Zitholele Consulting, who are undertaking an EIA on behalf of Eskom for a proposed domestic waste site at Tutuka power station, and through liaison with the local municipality and other organisations in the area. The initial database included neighbouring landowners[5], relevant district and local municipal officials, relevant national and provincial government officials, and organisations in the area. This database is augmented via chain referral, and is continually updated as new I&APs are identified throughout the project lifecycle. The current list of I&APs, comprising approximately 110 individuals and organisations, is included in **Annexure E**. The sectors of society represented by I&APs on the database are listed below.

(i) Provincial government (Mpumalanga);
(ii) Local government (Lekwa LM and Gert Sibande District Municipality);
(iii) Organised agriculture;
(iv) Business/Commerce;
(v) Industry;
(vi) Local landowners;
(vii) Local communities and other community based organisations in the project area; and
(viii) Media.

3.2.2 Compilation and distribution of Background Information Document

A BID for the proposed project was compiled in English and Afrikaans. The BID provided a background to the proposed project and highlighted the legal requirements and EIA process to be followed for the project. A Response Form was attached, inviting I&APs to provide

[5] Eskom is the owner of the land upon which the proposed infrastructure would be located.

comments on the proposed activities, to identify any further I&APs who should be consulted, and to register on the I&AP database. The BID and Response Form were distributed via post, or e-mail to all I&APs on 25 January 2010. A copy of the BID is included in **Annexure C**.

3.2.3 Advertising in regional and local newspapers

Advertisements for the EIA process appeared in regional and local newspapers between 25 January 2010 and 2 February 2010, as reflected below. The advertisements provided a description of the proposed activities and EIA process, and invited members of the public to register as I&APs, and raise any initial issues or concerns. Copies of the advertisements are included in **Annexure C**.

Table 3.1 List of publications including advertisement language and date

Coverage	Publication	Language	Date
Regional	Beeld	Afrikaans	29 January 2010
	The Citizen	English	29 January 2010
Local	Highveld Tribune	English	2 February 2010
		Afrikaans	
	Standerton Advertiser	English	29 January 2010
		Afrikaans	

3.2.4 Site notices

Site notices were placed on site at power station entrances (east and west) and at the ash dump entrance gates. The notices provided a description of the proposed activities and EIA process, and invited members of the public to register as I&APs, and raise any initial issues or concerns. The content of the site notices is included **Annexure C** as well as photographs of the site notices.

3.3 ISSUES AND CONCERNS RAISED

Issues were submitted via telephone, mail, fax and e-mail during the comment period from 25 January 2010 until 1 March 2010. Comments and concerns raised by I&APs (see **Annexure F**) with regards to the proposed activities have been incorporated into a CRR which is included as **Annexure G**. The CRR summarises all the issues and concerns raised by I&APs during the Scoping Process, and provides the project team and proponent's response thereto. The issues raised by I&APs to date can briefly be summarised as follows:

- Polluted runoff
- I&AP database
- Labour practices

3.4 COMMENT ON DRAFT SCOPING REPORT

~~The next stage of the public participation process involves the lodging of~~ The Draft Scoping Report (DSR) was lodged in public libraries and on the Aurecon and Eskom websites, respectively, and ~~hosting a~~ Public Meeting/ Open House was hosted.

The Public Meeting/ Open House was held on **Wednesday, 24 March 2010** to present and discuss the findings of the DSR at the following venue:

Date	***Venue***	***Time***
24 March 2010	Thuthukani Community Centre, Thuthukani	17h00-20h00

Note that the formal meeting only started at 18:00. An Open Day was held from 17h00 before this whereby information from the Scoping Report was on view (e.g. posters and maps), and the project team was available to answer questions. The purpose of the meeting was to present the findings of the DSR and provide the public with an opportunity to comment on the DSR. A focus group meeting was also held on **Wednesday, 24 March 2010, 11h00-13h00**. ~~Should you wish to attend please RSVP for further details.~~

All registered I&APs were notified of the meetings by means of a letter sent by post, fax or e-mail on 10 March 2010. Furthermore, public notices were placed in the local newspaper, the Standerton Advertiser and the Highveld Tribune[6] , on 11 March 2010 and 16 March 2010 respectively, inviting the general public to attend the meetings. The notification letters also included a copy of the Executive Summary of the DSR in English, Afrikaans, Zulu and Sotho. Copies of the DSR were lodged on Eskom's website (www.eskom.co.za/eia), Aurecon's website (www.aurecongroup.com follow the Africa-Middle East and public participation links), the Thuthukani Public Library in Thuthukani, the Standerton Public Library and the security centre at Tutuka Power Station from Wednesday, 10 March 2010. Notification letters, advertisements and notes on the public meeting/open house and focus group meeting have been included in **Annexure H** of this report.

I&APs had 30 days, until 12 April 2010, to submit their written comments on the DSR Cognisance was taken of all comments in compiling the final report, and the comments, together with the project team and proponent's responses thereto, are included in the final report. Where appropriate, the report has been updated.

Comments were directed to:
Public Participation office: Aurecon
Lindiwe Gaika or Karen Shippey
P O Box 494, Cape Town, 8000
Tel: (021) 481 2501
Fax: (021) 424 5588
Email: lindiwe.gaika@af.aurecongroup.com

[6] Although NEMA only requires one round of notification advertisements it was decided to advertise a second time.

Technical queries about the EIA: Aurecon
Louise Corbett or Ashwin West
P O Box 494, Cape Town, 8000
Tel: (021) 481 2501
Fax: (021) 424 5588
Email: louise.corbett@af.aurecongroup.com

3.5 COMMENT ON THE FINAL SCOPING REPORT

As is required by the NEMA EIA Regulations, I&APs must be given the opportunity to comment on all draft and final reports. Consequently, once the Scoping Report has been finalised, it will made available for a 21 day comment period. The report will be made available in the same locations in which the DSR was made available, and I&APs will be notified of the availability of the Final Scoping Report in writing.

3.6 REVIEW AND DECISION PERIOD

~~On completion,~~ The Final Scoping Report will be submitted to DEA for their review and decision[7] regarding acceptance of the report and related Plan of Study for EIA. DEA will thereafter issue a letter accepting the Scoping Report and Plan of Study for EIA and advise the EAP to proceed with the tasks contemplated in the Plan of Study, or request amendments or reject the Scoping Report and Plan of Study for EIA.

[7] The Final Scoping Report will also be made available to registered I&APs for 21 days, as required by the NEMA Amendment Act No. 62 of 2008.

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4 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The purpose of this Chapter is to provide a brief description of the affected environment and the potential impacts that could result from the proposed project. Where additional information is required for detailed assessment in the EIAR, the ToR for specialist studies are given.

4.1 INTRODUCTION

The description of the affected environment given below draws on existing knowledge from published data, previous studies, site visits to the area and discussions with various role-players. The identification of potential impacts which may occur as a result of the proposed activities described in **Chapter 2** of this report is broad, to cover the operational phase as well as the construction phase of the project. In cases where there is currently inadequate information to facilitate assessment of the potential impact, a draft ToR and proposed specialist consultant is provided. Impacts of lesser importance are also screened out, with reasons provided, to ensure that the EIAR is focused on the potentially significant impacts.

4.2 BROAD DESCRIPTION OF THE AFFECTED BIOPHYSICAL AND SOCIO-ECONOMIC ENVIRONMENT

4.2.1 Description of site

The Tutuka property (the site) consists of Farm Pretorius Vlei No. 374 Portions 4, 10 and 11, Farm Mooimeisjesfontein No. 376 Portions 1, 2, 4, 8 and 10 and Farm Spioenkop No. 375 Portion 1, Standerton (see **Figure 4.1**). All portions are owned by Eskom. The site is located approximately 22 km north east of Standerton and 33 km south east of Secunda.

The site is approximately 4 329,56 ha in extent and is zoned Special Purpose. More detailed descriptions of the site are provided below.

4.2.2 Climate

The broad municipal area is situated in a subtropical climate zone and experiences rainfall during summer months between September and May. Throughout the region, 95% of the rainfall is received during the six summer months, October to March, but months of maximum precipitation are either January or February. The western part of the area, in which the power station is situated, can receive between 600 -800 mm per annum (Lekwa LM, 2008).

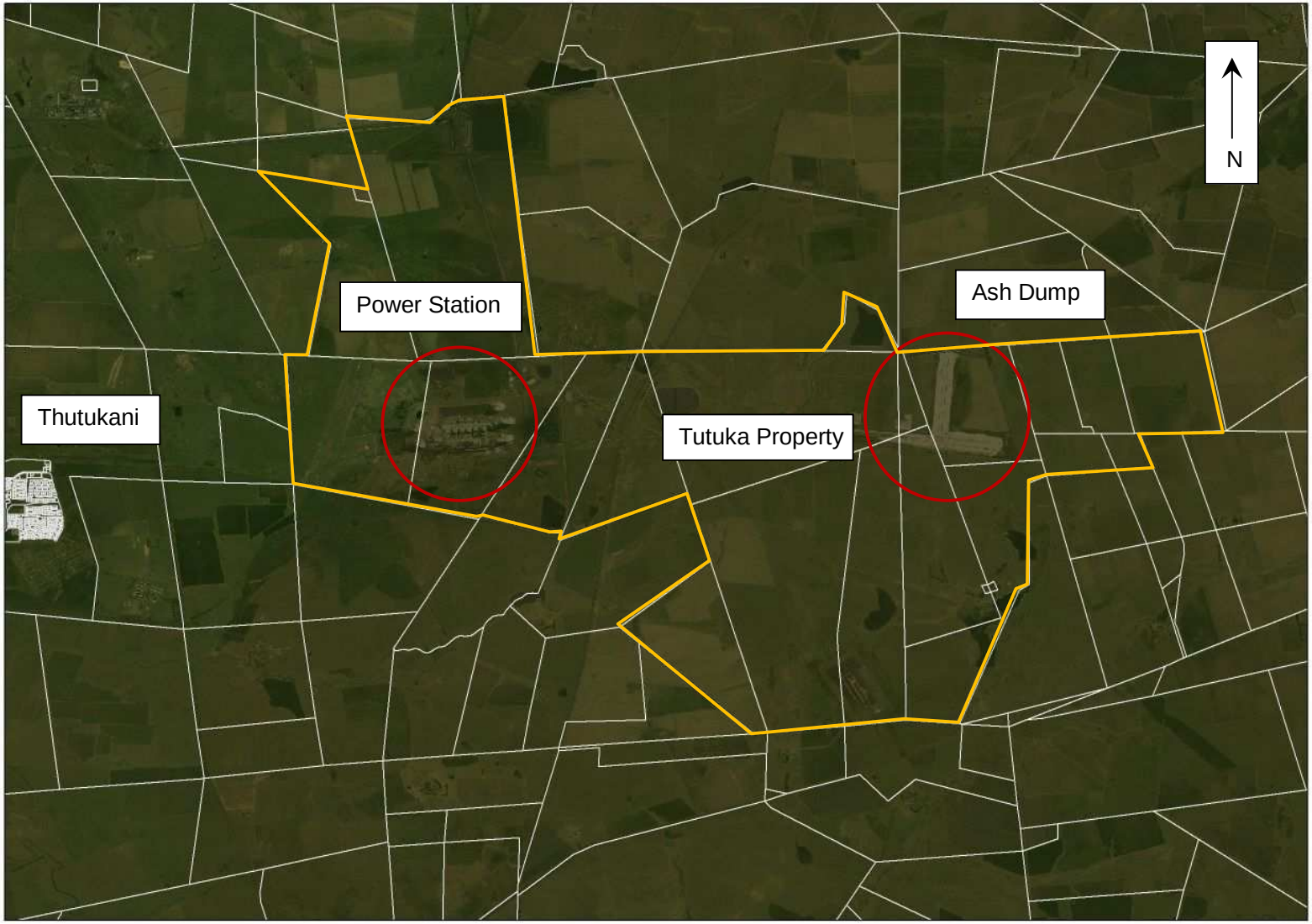

Figure 4.1 Map of Tutuka power station showing cadastral boundaries

In the summer the temperatures range as high as 40°C during the day with winter high temperatures reaching 20℃. Hailstorms are common i n the summer months and frost occurs in winter, but generally for less than 30 days per year.

4.2.3 Topography

The municipal area is fairly flat without any areas with slopes greater than 9 % (Lekwa LM, 2008). The area surrounding the Tutuka power station is located at some 1 640 metres above mean sea level. The area is gently undulating, with a very gradual slope north to south towards the Grootdraai Dam. The power station precinct and ash dump are located at the highest point in the immediate surrounds.

4.2.4 Fauna and Flora

According to Mucina and Rutherford (2006) the vegetation type found in the vicinity of the Tutuka power station and surrounding areas is Soweto Highveld Grassland. This vegetation type is found throughout Mpumalanga and Gauteng and to a very small extent in the Free State and North West provinces. It is gently to moderately undulating and supports a short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses. This vegetation type is considered to be Endangered, with only a handful of patches conserved. The conservation target is 24 %. The majority of the vegetation has been transformed due to cultivation, urban sprawl, mining and road infrastructure.

While the majority of the site is used for power station activities, grasslands do surround the ash dump as well as in the area between the power station and the New Denmark Colliery. The power station is approximately 25 km north west of the nearest conservancy, Bloukop conservancy.

According to the Lekwa Local Municipality (LM) Spatial Development Framework (SDF) (2008) the Lekwa LM does not have any areas of particularly high biodiversity. This is due to the high levels of transformation of the natural vegetation of the province. It is possible that a few small mammals, such as mongoose, and birds are found to breed and forage on the site and surrounds.

The majority of the power station site is considered to be areas of 'No Natural Habitat Remaining' in terms of the Mpumalanga Biodiversity Conservation Plan (MBCP)(2007) (see **Figure 4.2**). A few areas of site are marked as 'Important and Necessary' and 'Least Concern'. The MBCP is intended to guide conservation and land-use decisions in support of sustainable development in Mpumalanga. The MBCP areas indicated as 'Irreplaceable', 'Highly Significant' and 'Important and Necessary' should remain unaltered and should be managed for biodiversity by various means. Other categories incorporate increasing options for different types of land use that should be decided by the application of EIA procedures and negotiation between stakeholders.

Figure 4.2 Tutuka power station site overlain with the MBCP

4.2.5 Surface and groundwater

The Lekwa LM is situated within the Upper Vaal Water Management Area. The Vaal River flows through the municipal area, and forms part of the southern and eastern boundary of the municipality. The Grootdraai Dam, situated upstream of Standerton, is a major impoundment within the upper Vaal system, and is primarily used for flow attenuation and water supply (Lekwa LM, 2008).

The site falls within the Vaal River primary catchment. The power station precinct falls within quarternary catchment C11K whilst the ash dump falls within quarternary catchment C11L. As can be seen in **Figure 4.3** two small tributaries originate on site. The tributary originating near the power station precinct feeds westwards into the Leeuspruit River which flows northwards away from the Grootdraai Dam. The Leeuspruit River, as well as its tributary, is a perennial river with a Present Ecological Status (PES) of Class C: Moderately Modified and is considered as Critically Endangered.

The tributary originating near the ash dump is a non-perennial river, with a PES of Class E: Not an Acceptable Class and is also considered to be Critically Endangered. It flows directly into the Grootdraai Dam, from where the power station obtains its raw water. The Grootdraai Dam is a major impoundment within the upper Vaal system (Lekwa LM, 2008).

Wetlands on the site and in the surrounding areas are also indicated in **Figure 4.3**.

Perched and regional aquifers are present at the site (Bean and van Niekerk, 2000). Observations by Bean and van Niekerk (2000) of results from drilling on site indicate a perched aquifer between the impermeable/semi-permeable layer at the bottom of the ash dump, as well as naturally perched aquifers within the Karoo sediments. A second perched aquifer was found within the ash and indications are that this aquifer has a surface water source. Thus there is a possibility that surface water is migrating along paleaochannels[8] that underlie the southwestern corner of the ash dump. Evidence points to these paleaochannels acting as preferential pathways for recharge from rainfall, surface water sources or reject irrigation.

4.2.6 Geology and soil

The Lekwa LM area is underlain predominantly by dolerite and shale of the Ecca Group, with deposits of arenite and mudstone within the area (Lekwa LM, 2008)(see **Figure 4.4**). The Ecca Group forms part of the Karoo Supergroup. Dolerite dykes and sills are common and occur throughout the site (Bean and van Niekerk, 2000). The underlying rock is overlain by residual and transported soils (Zitholele Consulting, 2009). The ash dump and the majority of the power station precinct are underlain by arenite. A portion of the power station precinct, including the location alternatives of the proposed reject treatment works, is underlain by dolerite (Zitholele Consulting, 2009).

[8] Historical channels.

Figure 4.3 Wetlands and rivers located on the site and surrounding areas as well as quarternary catchments

Figure 4.4 Geology of the site and surrounding areas

The soil potential for the municipal area varies between soils with intermediate suitability for agriculture to soils that have poor agricultural potential (Lekwa LM, 2008).

4.2.7 Population demographics

The Tutuka power station is located within the Gert Sibanda District Municipality and Lekwa LM. Lekwa LM has a total population of 103 263 of which 65 % of the population is located in urban areas. The population comprises 86 % Black, 11 % White, 2 % Coloured and 1 % Indian or Asian people (Lekwa LM, 2008).

Of the residents, 10 % are under school going age, 33.4 % are at school going age, 52.3 % are economically active and 4.3 % are economically inactive. Of the adults older than 20 years, 36.3 % have education levels between Grade 1-7 (primary school), 54.9 % have between Grade 8-12 (high school), 6.4 % have some tertiary education and 2.3 % have no schooling (Lekwa LM, 2008) (Lekwa LM, 2008).

According to the Lekwa LM IDP (2009), the economy is dominated by four sectors in terms of employment, namely agricultural related work (28.2 %), community services (17 %), private household employment (15.6 %) and wholesale and retail employment (11.7 %)

The economically active section of the population consists of 63.5 % employed and 36.5 % unemployed persons (Lekwa LM, 2009). This unemployment rate is well above the South African average of 24.3 % unemployed (in the second quarter of 2008)[9].

The occupation structure of the employed persons shows that the majority of employed people are concentrated in elementary occupations (39.0 %), other occupations (12.5 %) and as plant operators (12.3 %).

4.2.8 Surrounding land uses

The surrounding land use is mainly agricultural, including grain farming and cattle. Approximately 5 km to the north east of the site is the New Denmark Colliery which is dedicated to the Tutuka power station. Approximately 3 km west of the site is Thuthukani township, a small town housing power station and New Denmark Colliery employees as well as private residences.

[9] http://www.statssa.gov.za/keyindicators/keyindicators.asp

4.3 OPERATIONAL PHASE IMPACTS ON THE BIOPHYSICAL ENVIRONMENT

This section of the report describes the biophysical environment and considers the long-term or operational phase impacts on the biophysical environment that may be associated with the proposed activities, including the following:

- Impact on the terrestrial fauna and flora;
- Impact on aquatic flora and fauna; and
- Impact on groundwater resources.

Long-term impacts on the socio-economic environment are described in **Section 4.4**, while the construction phase impacts are outlined in **Section 4.6**.

4.3.1 Impact on terrestrial fauna and flora

As noted in **Section 4.2.4** the vegetation type found in the vicinity of the Tutuka power station, Soweto Highveld Grassland, is considered to be Endangered. Furthermore, a few areas of the site are marked as 'Important and Necessary' and 'Least Concern' in terms of the MBCP. While the majority of the site is used for power station activities, grasslands do surround the ash dump as well as in the area between the power station and the New Denmark Colliery. The power station is approximately 25 km north west of the nearest conservancy, Bloukop conservancy.

Also noted in **Section 4.2.4** is the lack of any areas of particularly high biodiversity due to the high levels of transformation of the natural vegetation of the province. It is however, possible that a few small mammals, such as mongoose, and birds are found to breed and forage on the site and surrounds.

The proposed project could have impacts on flora and fauna through the footprint of its infrastructure, namely the treatment works and pipelines from the ash dump to the power station and from the power station to the New Denmark Colliery. It must be noted that the proposed groundwater treatment plant would be located on a portion of rehabilitated ash dump, which is an artificial area created by the development of the ash dump and is therefore unlikely to support indigenous vegetation which requires conservation. Furthermore, the proposed locations for the reject concentration plant expansion are adjacent to the existing RO plant in the middle of the power station precinct (an area which has been massively transformed due to the construction activities), and are once again unlikely to support vegetation requiring conservation.

Despite the above, and given that the proposed project could disturb endangered Soweto Highveld grassland, and/or patches of 'Important and Necessary' areas of land in terms of the MBCP (specifically with respect to the pipeline components of the project), it is recommended that a specialist terrestrial ecology assessment be undertaken, focused within the site. The proposed ToR for this specialist study are as follows:

- Conduct an ecological and floristic assessment to determine the present state of the environment on the property and to identify potential impacts that could be caused by the proposed activity. The report will address the following:
    - Vegetation: Veld composition in terms of:·
        - Vegetative structure and classification (main vegetation types);
        - Plant species identification, including an indication of dominant species, rare and endangered species (Red data species), and exotic and invader species;
        - Plant species and the environment; and
        - Plant species inter-relations.
    - Vegetation: Veld condition:
        - Assessment of veld condition;
        - Interpretation of veld condition assessment;
        - Rehabilitation needs and options; and
        - Conservation status and potential.
    - Terrestrial fauna
        - Animal species identification, including an indication of dominant species, rare and endangered species (Red data species), and exotic and invader species; and
        - Animal species and their habitats.
    - Recommendation of mitigation measures to reduce or eliminate potential impacts on the terrestrial ecological environment.

It is proposed that Dr Johan du Preez of Makecha Development Associates undertake the requisite assessment. He is an ecologist with a doctorate in plant ecology. He has extensive knowledge of the region and experience in undertaking similar assessments, and is also a senior lecture at the University of the Free State.

Mr Ben Steyn of Mooimeisiesfontein Farm, located immediately south of the ash dump, noted in the focus group meeting on 24 March 2010 that many birds were present at wetlands near the ash dump. Should there be many birds present, it is possible that the proposed project could affect them by disturbing nesting sites or feeding habitat. As such it is recommended that a specialist avifaunal study is undertaken, focused on the area surrounding the ash dump. The proposed ToR for this specialist study are as follows:

- Undertake a desktop review of the site and surrounding area to identify avifaunal species potentially present in the area;
- Undertake a site visit to determine the presence of avifauna;
- Identify and assess potential impacts on avifauna;
- Recommend mitigation measures to reduce or eliminate potential impacts on avifauna.

It is proposed that Mr Doug Harebottle undertake the requisite assessment. He is an avifaunal specialist with a Masters in conservation biology. doctorate in plant ecology. Mr Harebottle has been involved in co-ordinating and managing various national bird programmes and is currently responsible for co-ordinating the Waterbirds Ringing Programme in Africa.

4.3.2 Impact on aquatic flora and fauna

As noted in **Section 4.2.5** and indicated in **Figure 4.3** two small tributaries originate on site. Furthermore, a number of wetlands are shown to be located on the site and in the surrounding areas in **Figure 4.3**.

South Africa recognises the importance of its wetlands as sensitive ecosystems that require conservation, and accordingly has become a signatory to the international Convention on Wetlands of International Importance (also known as the Ramsar convention). While there are no Ramsar listed wetlands in the vicinity of the sites, the importance of wetland conservation is noted.

Concerns have been raised that polluted runoff from the ash dump could flow into the Grootdraai Dam. Apparently Sasol has, in the past, raised concerns regarding minerals found in the water at the Grootdraai Dam pump station which provides water to the Sasol facilities at Secunda. However, Eskom operates a Zero Liquid Effluent Discharge philosophy, and has a clean and dirty water system to avoid impacts of dirty runoff from the ash dump (as well as the power station precinct, etc). Essentially the dirty water system consists of a trench downstream of the ash dump. This trench traps ash dump runoff and channels it to Eskom's dirty water dam, located to the south of the ash dump. Clean water is captured by a similar trench upstream of the ash dump and channeled to the clean water dam below the dirty water dam. Impurities in the dirty water dam settle out and the water is used for dust suppression purposes on the ash dump. The water level of the dirty water dam is monitored and, should it be very high with a risk of overflow, water is pumped to the power station dirty water dam to prevent overflows. Water from the clean water dam is recycled back to the power station raw water dam and used for power station processes. Similar systems operate in the power station precinct, coal stockyard, etc. As such, runoff from the ash dumps or any operations at the power station would not enter the natural drainage system and enter the Grootdraai Dam, under normal operating conditions.

The proposed treatment works and associated pipelines could have an impact on the extent and integrity of any wetlands on the site. Given the importance of the conservation of water resources in South Africa, specifically wetlands, it is recommended that an aquatic ecology assessment be undertaken. The proposed ToR for this specialist study are as follows:

- Undertake a wetland assessment, which entails the following tasks:
    - A delineation and classification of the wetlands within the proposed site;
    - A characterization of the key and indicator fauna and flora species found in the identified wetlands;
    - An assessment of the ecosystem services supplied by those wetlands;
    - An assessment of the wetlands PES or integrity;
    - Assessment of Ecological Importance and Sensitivity of the wetlands; and
    - An assessment of the impacts of the activities on the wetlands and possible recommendations for mitigation;
    - Identification and mapping of buffers.
- Undertake an aquatic study which includes an assessment of the following components:
    - Stressor Indicators;
    - Habitat Indicators; and

- Response Indicators.

Golder Associates, an environmental services consulting firm, represented by Mr Alan Cochran, has been appointed to undertake the aquatic ecological assessment. Mr Cochran has over four years experience in aquatic hydrology and has co-ordinated a number of studies in the Highveld.

4.3.3 Impact on groundwater resources

As noted in **Section 4.2.5** perched and regional aquifers are present at the site. Furthermore, there is a possibility that surface water is migrating along paleaochannels that underlie the southwestern corner of the ash dump and evidence points to these paleaochannels acting as preferential pathways for recharge from rainfall, surface water sources or reject irrigation.

Eskom has indicated that the groundwater beneath the ash dump, and potentially around other activities on site, is contaminated and is therefore proposing to treat the contaminated groundwater at the proposed groundwater treatment works. This would require Eskom to drill boreholes in order to intercept the contaminated groundwater. The treatment of the contaminated groundwater could have implications for downstream users through reduction of pollution risk in this regard. Furthermore, the diversion of the reject away from the ash dump and back to the colliery would also have an influence on groundwater pollution. A groundwater study is therefore necessary to determine, *inter alia*, the extent of the groundwater pollution (pollution plume), any other pollution sources, the potential to abstract polluted groundwater and the required rates of abstraction, as well as the location of the boreholes to achieve a reduction in polluted groundwater. GHT Consulting Scientists (GHT) undertake routine monitoring and auditing of the groundwater for the power station. GHT, led by Shaun Staats, have also been appointed by the power station to undertake the initial modelling of the pollution plume.

The ToR for the pollution plume modelling are as follows:

- Determine the nature and extent of the pollution plume which has occurred through the historic practice of irrigating brine at the ash dump and associated dirty water dams;
- Drill four test boreholes and conduct water analysis on each borehole. Determine the borehole recovery rate; and
- Model the likely effects of interception boreholes on the migration of the pollution plume including the current and future anticipated changes in water quality yielded by the interception boreholes.

GHT has experience in the evaluation of groundwater contamination, environmental site assessments at commercial and industrial facilities and the registration of landfill sites, amongst other services. Shaun Staats has over 20 years experience in conducting groundwater surveys and is a Professional Natural Scientist.

Aurecon's water use licensing team, led by Graham English, has been appointed to undertake an IWULA process as noted in **Section 1.2.4a)**. This process would include a groundwater study, to be undertaken by Dr Mannie Levin of Aurecon, which would interpret the pollution plume modelling being undertaken by GHT.

The ToR for the Aurecon groundwater study are as follows:

- Determine the sustainable yield of the contaminated aquifer for which interception boreholes are to be drilled and suitable locations for the production boreholes;
- Determine appropriate pumping rates in order to systematically reduce the pollution plume to steady state;
- Determine suitable monitoring boreholes to monitor the rate of reduction in the pollution plume; and
- Compile the technical documents for a water use license application.

Dr Levin has been involved in diverse projects in South Africa, Botswana, Swaziland, Angola, Mozambique, Taiwan, Ghana, Ethiopia, Gambia and Syria and Algeria. He is an expert in groundwater exploration, supply and resource and withdrawal evaluation. He also specialises in groundwater quality, waste disposal and pollution studies and several complex hydrogeochemical projects were successfully handled using groundwater chemistry and environmental isotopes as tracers. He has also successfully used these techniques in evaluating the sustainability of the ground water resources.

4.4 OPERATIONAL PHASE IMPACTS ON THE SOCIAL ENVIRONMENT

This section of the report describes the socio-economic environment and considers the long-term or operational phase impacts on the social environment that may be associated with the proposed activities, including the following:

- Visual impacts;
- Impact on the local economy;
- Noise impacts; and
- Impact on heritage resources.

4.4.1 Visual impacts

The area surrounding the Tutuka power station is located at some 1 640 metres above mean sea level. The area is gently undulating, with a very gradual slope north to south towards the Grootdraai Dam. The power station precinct and ash dump are located at the highest point in the immediate surrounds.

The landscape is covered in grassland with a few sparse trees. As such the power station is visible for many kilometres. The potential therefore exists that the proposed reject and groundwater treatment works would be visible from many kilometres away. The proposed locations of the proposed reject treatment works are amongst the power station infrastructure in the power station precinct, adjacent to the existing RO plant. As such the proposed reject treatment works would be in the context of the existing structures of the power station. The proposed groundwater treatment works would be located on a rehabilitated portion of the ash dump. Since there is sufficient information to assess this impact in the next phase of the project, a specialist investigation is not proposed.

4.4.2 Impact on heritage resources

Heritage resources include archaeological material (e.g. rock paintings, stone tools), palaeontological material (e.g. fossilised materials) and cultural heritage material (e.g. old graveyards, fences or ruins of buildings). Since some potential heritage material is buried, it is often only found during the construction phase of a project.

Due to the historical disturbances on site (construction of the power station and ash dump) it is unlikely that archaeological or cultural material would be found on site. However, the potential remains that the proposed reject and groundwater treatment works, and associated pipelines, could impact on heritage resources. It is also important to include mitigation measures in a construction phase Environmental Management Programme (EMP) to provide guidance to contractors in the event that archaeological or palaeontological material is found on site during the construction phase. Furthermore, as noted in **Section 1.2.3**, a pipeline of over 300 m length must be subjected to heritage study in terms of NHRA, and be approved prior to the commencement of the construction process.
It is therefore recommended that a Phase 1 Archaeological Assessment be undertaken. The ToR for the assessment are as follows:

- Undertake a Phase 1 archaeological assessment of the site in accordance with the requirements of Section 38(3) of the NHRA, which would entail:
    - Conducting a detailed desk-top level investigation to identify all archaeological, cultural and historic sites in the proposed development areas;
    - Undertaking field work to verify results of desktop investigation; and
    - Documenting (GPS coordinates and map) all sites, objects and structures identified on the site.
- Compile a report which would contains the following:
    - Identification of archaeological, cultural and historic sites within the proposed development areas;
    - Evaluation of the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction);
    - Recommendation of mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance; and
    - The preparation of a heritage resources management plan which includes recommendations on the management of the objects, sites or features, and also guidelines on procedures to be implemented if previously unidentified cultural resources are uncovered during later developments in the area.

Dr Johnny van Schalkwyk, an independent heritage consultant, has been appointed to undertake the requisite heritage impact assessment. Dr van Schalkwyk has undertaken over 800 archaeological, anthropological and social impact assessments, including the assessments of three coal-fired power station projects in the Northern Free State, Mpumalanga and Limpopo.

Other projects assessed include powerlines, roads, pipelines, dams, mine developments, water purification works, historical landscapes, refuse dumps and urban developments.

4.4.3 Impact on local economy

As noted in **Section 4.2.7** the unemployment rate for Lekwa LM is well above the South African average of 24.3 % unemployed (in the second quarter of 2008)[10]. The occupation structure of the employed persons shows that the majority of employed people are concentrated in elementary occupations (39.0 %), other occupations (12.5 %) and as plant operators (12.3 %).

The establishment of the proposed reject and groundwater treatment works would provide a small number of jobs during the construction phase (70 persons) and five people per shift during the operation phase. There are three shifts per day and the duration of each shift is eight hours therefore an additional 15 people would be employed for the operation phase. An additional two persons may be required for the ground water treatment plant.
Due to the small number of jobs which would be created there is unlikely to be any measurable difference to the local economy of the area. As such this potential impact will not be assessed in the EIAR.

4.5 NOISE IMPACTS

The area surrounding the Tutuka power station consists predominantly of undulating grazing lands. As such the rural atmosphere generates little noise. The power station itself is the largest source of noise pollution in the area, together with the ash conveyors and other activities on site. The potential exists for noise from the proposed reject and groundwater treatment works to affect surrounding landowners.

A standard wastewater treatment works generates a noise level of 40 dB at a distance of 300 m, based on the noise for the aerators. A noise level of 40 dB in itself is considered to be quiet, and for the sake of comparison, normal conversation has a noise level of some 65 dB.

The existing RO Plant is located on the western side of power station precinct in close proximity to the coal milling plant and conveyors for one of the boiler units. Consequently, the ambient noise levels are elevated due to industrial activity taking place in the vicinity of the RO plant. Furthermore, the noise generated by the RO plant is very high with ear protection required for employees who work within the plant. However, the high noise levels of the RO plant are contained within an enclosed building, such that ear protection is not required if one is located outside the RO plant building. It is anticipated that the reject concentration plant would be housed in a similar building to that used to house the RO plant. However, the reject concentration plant may generate high levels of noise.

The boundary of the power station site is over 1 km from the proposed location of the proposed reject concentration plant, providing a noise buffer between Eskom activities and the

[10] http://www.statssa.gov.za/keyindicators/keyindicators.asp

surrounding landowners. Given the wealth of information that exists with respect to noise generation, the EAPs believe that there is sufficient existing information to adequately assess the potential impact of noise on the socio-economic environment, without the need for a specific specialist investigation.

4.6 CONSTRUCTION PHASE IMPACTS ON THE BIOPHYSICAL AND SOCIAL ENVIRONMENTS

The construction phase is likely to result in a number of negative impacts on the biophysical and the social environment. These could potentially include:

- Disturbance of flora and fauna;
- Sedimentation and erosion of water ways;
- Increase in traffic volumes;
- Storage of hazardous substances on site;
- Increased risk of fire;
- Noise pollution; and
- Dust impact.

The significance of construction phase impacts is likely to be limited by their relatively short duration, since the construction phase should last approximately 18 months. Many of the construction phase impacts could be mitigated through the implementation of an appropriate EMP. During the EIA Phase, the construction phase impacts on the biophysical and socio-economic environment will be assessed, in terms of the methodology outlined in the Plan of Study for EIA (see **Chapter 5**). Furthermore, an EMP will be compiled as part of the EIA process, and submitted as part of the EIAR, to provide mitigation and ascribe responsibilities for many of the construction phase impacts.

4.6.1 Disturbance of flora and fauna

This impact considers impacts beyond the permanent footprint impacts of the proposed reject concentration plant and groundwater treatment works. Alien plant seeds could be introduced with construction material such as sand or other materials, with any disturbed areas being particularly vulnerable.

Any affected fauna would generally be largely mobile and would relocate during the construction phase and are likely to recolonise the area, once the construction phase has been completed and the disturbed areas rehabilitated.

4.6.2 Sedimentation and erosion

The sediment loads of any drainage depressions and wetlands may increase due to the excavations on the site, the laying of linear infrastructure across drainage lines and other

construction related activities. This would be exacerbated during the wet season and during intense rainfall events.

4.6.3 Increase in traffic volumes

Construction vehicles are likely to make use of the existing roads, including the R38, to transport equipment and material to the construction site. Construction related traffic could impact negatively on the traffic flow in the vicinity and on the integrity of the affected roads. This may exacerbate the risk of vehicular accidents.

4.6.4 Storage of hazardous substances on site

As at any construction site, various hazardous substances are likely to be used and stored on site. These substances include amongst other things, diesel, curing compounds, shutter oil and cement. Utilisation of such substances in close proximity to the aquatic environment such as wetlands is of greater concern than when used in a terrestrial environment.
Use of hazardous substances at a construction site is controlled by various pieces of legislation. The management and protection of the environment would however be achieved through the implementation of an EMP, which would *inter alia* specify the storage details of hazardous compounds and the emergency procedures to follow in the event of a spillage.

4.6.5 Increased risk of fire

Temperatures in the Highveld can rise to 40ºC in summer. Furthermore, the grassland vegetation is prone to fires started by lightning strikes in summer. Construction activities onsite may increase the risk of fire in the area in both the wet summer months and the dry winter months. The outbreak of fire at the construction site could have serious safety, economic and ecological implications. The risk of fire would be managed through the EMP, which would include procedures for dealing with emergency situations such as fires.

4.6.6 Noise pollution

An increase in noise pollution would be expected from the operation of heavy machinery during the construction period, as well as due to the increased traffic. The severity of this impact is likely to be reduced due to the low numbers of people in close proximity to the site, and the existing background noise of the power station.

4.6.7 Dust impacts

Construction vehicles are likely to make use of the existing roads, including the R38 and roads to the ash dump, to transport equipment and material to the construction site. Earthworks would

also be undertaken. These activities would exacerbate dust especially in the dry winter months. The dust impact would be managed through the EMP, which would include procedures for dealing with dust pollution events including watering of roads, etc.

5 PLAN OF STUDY FOR EIA

The purpose of this Chapter is to detail the Plan of Study for the EIA Phase to ensure that this EIA process satisfies the requirements of NEMA.

5.1 PURPOSE OF THIS PLAN OF STUDY FOR EIA

The Scoping process has been documented in this Scoping Report, which has identified various potential environmental impacts and project alternatives that require detailed investigation. This Plan of Study is the culmination of the Scoping Phase and its purpose is to ensure that the EIA Phase of this EIA process satisfies the requirements of NEMA. Accordingly, this Plan of Study for EIA outlines the anticipated process and products for the EIA Phase.

This Plan of Study for EIA has been compiled in terms of GN No R.385 of 21 April 2006 of NEMA and will be submitted to DEA for their consideration.

5.2 DESCRIPTION OF THE ACTIVITY

The nature of the activity is described in detail in **Chapter 2**, but in brief includes the following:

- Construction of a reject concentration plant;
- Construction of a groundwater treatment works.

Associated infrastructure that would also be established includes the following:

- A pipeline from the proposed reject concentration plant to the New Denmark Colliery;
- Pipelines from the abstraction boreholes to the proposed groundwater treatment works;
- A pipeline from the proposed groundwater treatment works to the existing reject treatment works; and
- Boreholes and pipelines from the boreholes to the proposed groundwater treatment works.

5.3 DESCRIPTION OF TASKS TO BE PERFORMED

5.3.1 Potential environmental impacts identified during Scoping

Chapter 4 has reviewed the range of potential environmental impacts associated with the proposed reject concentration plant and groundwater treatment works at Tutuka power station in Mpumalanga. Pursuant to this scoping exercise, which was based on available literature, input from the authorities, I&APs and various specialists, a shortlist of potentially significant environmental impacts was identified for further, more detailed investigation during the EIA Phase. Specifically the following potential environmental impacts have been identified:

- Operational phase impacts on the biophysical environment:
    - Impact on the terrestrial fauna and flora, including avifauna;

  - Impact on aquatic flora and fauna; and
  - Impact on groundwater resources.
- Operational phase impacts on the social environment:
  - Visual impacts;
  - Noise impacts; and
  - Impact on heritage resources.
- Construction phase impacts on the biophysical and social environments:
  - Disturbance of flora and fauna;
  - Sedimentation and erosion of water ways;
  - Increase in traffic volumes;
  - Storage of hazardous substances on site;
  - Increased risk of fire;
  - Noise pollution; and
  - Dust impact.

5.3.2 Method of assessing the significance of potential environmental impacts

This section outlines the proposed method for assessing the significance of the potential environmental impacts outlined above. As indicated, these include both operational and construction phase impacts.

For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) would be described. These criteria would be used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the EIAR would represent the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.[11]

The tables on the following pages show the scale used to assess these variables, and defines each of the rating categories.

[11] The applicant will be requested to indicate at the Draft EIAR stage which alternative and mitigation measures they are prepared to implement.

Table 5.1 Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	**Regional**	Beyond a 5 km radius of the candidate site.
	Local	Within a 5 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very Low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*
Duration of impact	**Construction period**	Up to 2 years
	Short Term	Up to 5 years after construction
	Medium Term	5-15 years after construction
	Long Term	More than 15 years after construction

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in **Table 5.2**.

Table 5.2 Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	• High magnitude with a regional extent and long term duration • High magnitude with either a regional extent and medium term duration or a local extent and long term duration • Medium magnitude with a regional extent and long term duration
Medium	• High magnitude with a local extent and medium term duration • High magnitude with a regional extent and construction period or a site specific extent and long term duration • High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration • Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Low magnitude with a regional extent and long term duration
Low	• High magnitude with a site specific extent and construction period duration • Medium magnitude with a site specific extent and construction period duration • Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Very low magnitude with a regional extent and long term duration
Very low	• Low magnitude with a site specific extent and construction period duration • Very low magnitude with any combination of extent and duration except regional and long term
Neutral	• Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact, would be determined using the rating systems outlined in **Table 5.3** and **Table 5.4** respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the REVERSIBILITY of the impact is estimated using the rating system outlined in **Table 5.5**.

Table 5.3 Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 5.4 Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 5.5 Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

5.4 NEED FOR ADDITIONAL INFORMATION: SPECIALIST STUDIES

In reviewing the potential environmental impacts, all impacts initially identified during the Scoping Phase have been identified as being of concern and requiring further investigation. Accordingly, we propose to undertake the following specialist studies, in order to address a suite of potential environmental impacts.

Study	Consultant and Organisation
Terrestrial ecology assessment	Johann du Preez of Makecha Development Association;
Avifauna assessment	Doug Harebottle (independent consultant)
Aquatic ecology assessment	Alan Cochran of Golder Associates
Groundwater assessment	Shaun Staats of GHT and Mannie Levin of Aurecon
Heritage impact assessment	Johnny van Schalkwyk (independent consultant)

The ToR for these investigations as well as the identified specialists are outlined **Chapter 4**. A short summary of the various specialist consultants is given below. CVs are available upon request.

Dr Johan du Preez of Makecha Development Associates has over 24 years experience in the environmental field. Dr du Preez has been involved in numerous specialist studies for various developments including business and open space developments, fuel filling stations, housing developments, pipelines, power lines, roads, sewage works and reservoirs. Dr du Preez is the author of 36 research articles and technical reports and is a senior lecturer in ecology and environmental management at the University of the Free State.

Doug Harebottle has a Masters Degree in Zoology from the University of Cape Town, which focused on the conservation biology of the Spotted Thrush in southern Africa. Mr Harebottle has over 15 years experience in avifaunal research as well as environmental areas. Mr Harebottle has been involved in co-ordinating and managing various national bird programmes and is currently responsible for co-ordinating the Waterbirds Ringing Programme in Africa.

Mr Alan Cochran of Golder Associates, an environmental services consulting firm, has been appointed to undertake the aquatic ecological assessment. Mr Cochran has over three years experience in aquatic hydrology and has co-ordinated a number of studies in the Highveld.

Mr Shaun Staats of GHT has over 20 years experience in the field of modelling. His expertise is in numerical modelling of 3D groundwater flow and contamination, environmental control, groundwater exploration and resource evaluation, groundwater management, monitoring and evaluation of groundwater pollution, graphical information systems and software development. Mr Staats is also a Professional Natural Scientist.

Dr Mannie Levin is currently based in Pretoria and responsible for all ground water related investigations. These include ground water resources and quality, site selection for waste disposal, pollution investigations related to waste, industry and mining as well as environmental impact assessments. Dr Levin has been involved in diverse projects in South Africa, Botswana, Swaziland, Angola, Mozambique, Taiwan, Ghana, Ethiopia, Gambia and Syria and Algeria. He is an expert in groundwater exploration, supply and resource and withdrawal evaluation. He also specialises in ground water quality, waste disposal and pollution studies and several complex hydrogeochemical projects were successfully handled using ground water chemistry and environmental isotopes as tracers. He has also successfully used these techniques in evaluating the sustainability of the ground water resources.

Dr Johnny van Schalkwyk, a private heritage consultant, has been appointed to undertake the requisite heritage impact assessment. Dr van Schalkwyk has undertaken over 800 archaeological, anthropological and social impact assessments, including the assessments of two power station projects in the Northern Free State and Mpumalanga. Other projects assessed include powerlines, roads, pipelines, dams, mine developments, water purification works, historical landscapes, refuse dumps and urban developments. Dr van Schalkwyk has published more than fifty papers on topics relating to anthropology, archaeology, history and impact assessment in various scientific journals. He is the current Head of Research of the National Cultural History Museum.

5.5 REASONABLE PROJECT ALTERNATIVES IDENTIFIED DURING SCOPING

Chapter 2 reviewed a range of project alternatives associated with the proposed activities. Pursuant to this Scoping exercise, which was based on input from the authorities, I&APs and various specialists, a shortlist of reasonable project alternatives has been identified for further, more detail investigation during the EIA Phase, namely:

- Activity alternatives:
  - Concentration of reject via a reject concentration plant;
  - "No-go" alternative to reject concentration plant;
  - Treatment of polluted groundwater via a groundwater treatment plant; and
  - "No-go" alternative to the groundwater treatment plant.
- Location alternatives:
  - Three locations for the proposed reject plant; and
  - One location for the proposed groundwater plant.
- Site layout alternatives:
  - One layout per location.

Other potential alternatives were considered and screened out in **Chapter 2**. These are documented in **Section 2.3**.

5.6 THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

The purpose of the EIAR would be to undertake a comparative assessment of the relative significance of the potential environmental impacts for the proposed reject and groundwater treatment works activity, location and layout alternatives. The EIAR would thus include the following:

- A brief overview of the potential environmental impacts and reasonable alternatives identified during the Scoping investigation.
- A summary of the key findings of the various specialist studies as they pertain to the affected environment.
- An overview of the public participation process conducted during the compilation of the EIAR.
- A detailed assessment of the significance of the potential environmental impacts for the various project alternatives. This assessment, which would use the methodology outlined in **Section 5.3.2**, would be informed by the findings of the specialist studies, and professional judgement.
- An overview of the full range of mitigation measures including an indication of how these would influence the significance of any potential environmental impacts, together with a framework EMP. The mitigation measures would be informed by the specialist studies, professional experience and comment received from the I&APs.
- A set of recommendations regarding the way forward would be provided, should any of the proposed alternatives be authorised in terms of NEMA.

5.7 PUBLIC PARTICIPATION PROCESS

The purpose of the public participation process would be to provide I&APs with adequate opportunity to have input into the environmental process. The public participation process would include the following:

5.7.1 Public comment on the Draft EIAR

Following the completion of the Draft EIAR (refer to **Section 5.6** above), it will be lodged at the Thuthukani Public Library, Standerton Public Library and the security centre at Tutuka Power Station, as well as on the Eskom (www.eskom.co.za/eia) and Aurecon websites (www.aurecongroup.com[12]). Registered I&APs will be notified of the lodging by means of letters, and given 30 days in which to comment on the report. During the comment period a public meeting would be held in Thuthukani Community Centre in Thuthukani to enable I&APs to provide feedback on the draft report. The public would be notified of the meeting via a public notice in the local press and by way of the letter used to inform the I&APs of the lodging of the Draft EIAR.

All written correspondence would be in English, Afrikaans, Zulu and Sotho. The public meeting would also be run in English.

The public comments would be consolidated into an annexure of the EIAR. This would take the form of a CRR, which would summarise the issues raised and provide the Project Team's responses thereto. The draft report would also be revised in light of feedback from the public, where necessary.

5.7.2 Public comment on the Final EIAR

Once the EIAR has been finalised, it will be made available for a 21 day comment period. The report will be made available in the same locations in which the Draft EAIR was made available, and I&APs will be notified of the availability of the Final EIAR in writing. Any comments received will not be included in a CRR and will instead be collated and forwarded directly to DEA.

5.7.3 Opportunity for appeal

All registered I&APs would be notified in writing of the release of the Environmental Authorisation or Waste Management Licence. They would be reminded of their right to appeal against DEA's decision to the Minister of Environmental Affairs in terms of NEMA.

[12] Follow the Africa-Middle East and public participation links.

5.8 PROPOSED PROGRAMME

A summary of the proposed programme is given in the table below.

Table 5.6 Proposed EIA programme

Activity	Proposed date	Deliverable
2nd round of public engagement:		
• Letter to I&APs & adverts	10/03/2010	Informed I&APs
• Lodge draft SR in public venues and with Authorities	10/03/2010	DSR in libraries, websites etc.
• Open day & public meeting	24/03/2010	Public engagement
• Public comment period ends	12/04/2010	Updated CRR
Submit final SR (incl. Plan of Study for EIA) to environmental authority	21/04/2010	Approved SR & Plan of Study EIA
Specialist studies	03/2010 – 07/2010	Specialist reports
3rd round of public engagement:		
• Letter to I&APs & adverts	07/2010	Informed I&APs
• Lodge draft EIAR in public venues	07/2010	Draft EIAR in libraries, website etc.
• Open day & public meeting	08/2010	Public engagement
• Public comment period ends	08/2010	Updated CRR
Submit final EIAR to environmental authority	08/2010	Environmental Authorisation

5.9 PERSONNEL

As for the Scoping phase, Aurecon's Brett Lawson would provide strategic guidance to the EIA process and Ashwin West would undertake the management of the EIA process and, together with Louise Corbett, the requisite reporting. Mr Lawson is a certified EAPSA, and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. Mr West is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions.

Mrs Karen Shippey and Mrs Lindiwe Gaika of Aurecon would facilitate the public participation process. A short summary of these consultants is given below. CVs are available upon request.

Mr Brett Lawson spent 12 years in wildlife management and research with conservation agencies in southern and South Africa, and nine years in the more holistic field of environmental management in the National Lake Areas and with Eskom. Thereafter, Mr Lawson was one of the founders in 1995 of Bohlweki Environmental, the first emergent environmental consultancy established in South Africa, and later started The Environmental Partnership which he relinquished in 2004 as a fully empowered environmental consultancy. He thus has considerable multi-disciplinary experience across the range of environmental sciences.

As an Associate, ***Mr Ashwin West*** has been involved in undertaking EIAs, the development, implementation and auditing of EMPs, water resources and augmentation studies and the development, implementation and auditing of Environmental Management Systems in South Africa and the United Kingdom. Mr West has over seven years experience and has undertaken numerous projects in the petrochemical, housing and service supply industries amongst others.

As a Senior Environmental Practitioner, ***Ms Louise Corbett*** has been involved in undertaking EIAs, the development and implementation of EMPs, and the development and implementation of Environmental Management Systems. Ms Corbett has four years experience in the environmental field and has been involved with a variety of industries such as the petrochemical, housing, service supply and transport industries amongst others.

Mrs Karen Shippey has 13 years experience as an Environmental Practitioner working in the EIA, environmental management and policy field. Her experience includes project design, project management, understanding of the ecological, social and sustainable development requirements including specialist input co-ordination and process development. Mrs Shippey has developed significant expertise in the field of public and community engagement. This includes specialist facilitation, development of consultation processes and conflict resolution. She is an Associate in the Environmental Services Department of the Cape Town office.

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6 CONCLUSIONS AND WAY FORWARD

The purpose of this Chapter is to briefly summarise and conclude the Scoping Report and describe the way forward.

6.1 CONCLUSIONS

As per the requirements of NEMA, this Scoping investigation has reviewed a range of project alternatives and contemplated the array of potential environmental impacts associated with the following proposed activities in Mpumalanga:

- Construction of a reject concentration plant[13].
- Construction of a groundwater treatment works.
- Associated infrastructure that would also be established includes the following:
    - A pipeline from the proposed reject concentration plant to the New Denmark Colliery;
    - Pipelines from the abstraction boreholes to the proposed groundwater treatment works;
    - A pipeline from the proposed groundwater treatment works to the existing RO plant; and
    - Boreholes and pipelines from the boreholes to the proposed groundwater treatment works.

The following feasible alternatives have been identified for further consideration in the EIAR:

- Activity alternatives:
    - Concentration of reject via a reject concentration plant;
    - "No-go" alternative to reject concentration plant;
    - Treatment of polluted groundwater via a groundwater treatment plant; and
    - "No-go" alternative to the groundwater treatment plant.
- Location alternatives:
    - Three locations for the proposed reject plant; and
    - One location for the proposed groundwater plant.
- Site layout alternatives :
    - One layout per location.

Specifically the following potential environmental impacts have been identified for further consideration in the EIAR:

- Operational phase impacts on the biophysical environment:
    - Impact on the terrestrial fauna and flora, including avifaunal;
    - Impact on aquatic flora and fauna; and
    - Impact on groundwater resources.
- Operational phase impacts on the social environment:

[13] Should Eskom's application for exemption from undertaking an EIA and waste management licence process for the expansion of the brine evaporation activity be turned down, this activity would also be included in the scope of the current EIA process.

  - Visual impact;
  - Impact on heritage resources; and
  - Noise impact.
- Construction phase impacts on the biophysical and social environments.

The following specialist studies and specialists will be commissioned to provide more detailed information on those environmental impacts which have been identified as potentially being of most concern, and/or where insufficient information is available, namely:

Study	Consultant and Organisation
Terrestrial ecology assessment	Johann du Preez of Makecha Development Association;
Avifaunal assessment	Doug Harebottle (independent consultant)
Aquatic ecology assessment	Alan Cochran of Golder Associates
Groundwater assessment	Shaun Staats of GHT and Mannie Levin of Aurecon
Heritage impact assessment	Johnny van Schalkwyk (private consultant)

The rationale for these specialist investigations and the ToR has been outlined under the relevant impacts in **Chapter 4** of this report.

The approach to the EIA Phase should be conducted in terms of the guidelines outlined in the Plan of Study for EIA in **Chapter 5**.

6.2 THE WAY FORWARD

~~The next stage of the public participation process involves the lodging of~~ The DSR was lodged and a public meeting hosted to receive feedback on the DSR.

The open day and public meeting were be held on Wednesday, 24 March 2010. The details were as follows:

Date	***Venue***	***Time***
24 March 2010	Thuthukani Community Centre, Thuthukani	17h00-20h00

Note that the formal meeting only started at 18:00. An Open Day was held from 17h00 to 18h00 whereby information from the Scoping Report was on view (e.g. posters and maps), and the project team was available to answer questions. A focus group meeting was also held on **Wednesday, 24 March 2010, 11h00-13h00**. ~~Should you wish to attend please RSVP for further details.~~

Copies of theDSR were lodged in the following locations:

- Thuthukani Public Library
- Standerton Public Library
- Security centre at Tutuka Power Station
- www.eskom.co.za/eia; and

- www.aurecongroup.com (follow the Africa-Middle East and public participation links).

Notification letters, advertisements and notes of the public meeting and open day have been included in **Annexure H** of this report. Written comments on the report were received until Monday, 12 April 2010. Cognisance was taken of all comments when compiling the final report, and the comments, together with the study team's and client's responses thereto, have been included as an annexure in the Final Scoping Report. Where necessary, the report was updated to take these comments into account.

~~Once~~ The Final Scoping Report has been completed and all I&AP comments have been incorporated into the report, and the client has approved the report. Therefore it has been submitted to DEA and the Mpumalanga DARDLA for their review and comment, respectively. Registered I&APs have been notified of the submission of the Final Scoping Report and have been sent an Update Page. They have been afforded a 21 day period (i.e. until 11 May 2010)to comment on the Final Scoping Report to Aurecon, who will forward these on to DEA and include any comments in future EIA documentation. DEA will either reject the ~~application~~ report or instruct the applicant to proceed to the EIA Phase, either as proposed in the Plan of Study for EIAR, or direct that amendments are made before continuing.

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7.2 ELECTRONIC RESOURCES

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