ESKOM HOLDINGS LIMITED

EIA FOR THE PROPOSED CONSTRUCTION AND UPGRADING OF ACCESS ROADS FOR THE BRAAMHOEK PUMPED STORAGE SCHEME

PLAN OF STUDY FOR SCOPING

Contract Number: 460011104

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1 INTRODUCTION

1.1 Details of applicant

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1.2 Scope of the development

A pumped storage scheme utilises surplus off-peak electrical energy generated on the Eskom system to pump water from a lower to an upper reservoir and subsequently release this water again during peak load hours to generate electricity. A pumped storage scheme therefore relieves the need for other plants such as expensive gas fired turbines to meet peak loads, as well as relieving the need for the de-loading of coal fired generation during off-peak periods.

The site for the proposed Braamhoek Pumped Storage Scheme (BPSS) is situated 23 km northeast of Van Reenen on the farms Braamhoek and Bedford. The study area forms part of the uTukela Regional District and is situated on the boundary of KwaZulu Natal and the Free State. The area falls within the Drakensberg escarpment. The proposed upper reservoir is on the head water tributary of the Wilge River, which flows into the Vaal River system. The proposed lower reservoir is in the headwater of the Klip River, which in turn flows south-eastwards into the Tugela River. The scheme's two reservoirs will be interconnected by enclosed tunnel systems, with pump-turbine units with a potential generation capacity of 1332 MW. A locality map is attached as **Figure 1.**

Poltech led the Environmental Impact Assessment (EIA), which was completed in June 1999. A comprehensive Environmental Impact Report was submitted to the Department of Environmental Affairs and Tourism (DEAT) for approval. The Minister of DEAT at the time, Mr. Valli Moosa, issued a Record of Decision (RoD) authorising the construction of the Braamhoek PSS on 13 December 2002.

The upgrading of existing roads and the construction of new access roads will be required for the construction and operation of the Braamhoek PSS. The upgrading of roads and construction of new roads is a listed activity in terms of the Environmental Conservation Act (ECA) of 1989. An EIA is therefore required for these access roads.

1.3 Scope of Work

The scope of the work for the Scoping Phase is as follows:

- Ensure compliance with the Environment Conservation Act (Act 73 of 1989);
- Ensure that the process complies with the Guidelines that pertain to the Environmental Impact Management Process (i.e. Department of Environmental Affairs and Tourism Guideline Document: EIA Regulations, April 1998);
- Ensure that the process adheres to the principles of the National Environmental Management Act, 1998 (Act 107 of 1998). In this regard, the environmental assessment must address both the biophysical and socio-economic issues related to the proposed project and suggest practical mitigation or enhancement measures;
- Compilation of a Plan of Study for Scoping for the project; and
- Compilation of a Scoping Report (including a public participation).

2 APPROACH TO THE SCOPING STUDY

2.1 Introduction

The following section describes the tasks that will be carried out during the Scoping Study for this project.

The objective of the Scoping Study will be to identify potential environmental (socio-economic and biophysical) impacts, consider various options for road routings and identify issues of concern for stakeholders.

The Scoping Study will comprise the following steps:

- Pre-application meeting with environmental authorities;
- Submission of EIA application forms and Plan of Study for Scoping;
- Identification of stakeholders;
- Compilation of an electronic stakeholder database;
- Advertising the EIA in local media;
- Compilation of a Background Information Document (BID);
- Sending out personalised letters to key stakeholders advising them of the EIA;
- Key stakeholder briefing sessions with key stakeholders and traditional authorities;
- Key stakeholder workshop;
- Compilation of stakeholder issues report for inclusion in the Scoping Report;
- Technical assessment of alternatives;
- Compilation of a Draft Scoping Report (DSR);
- Advertising the availability of the Draft Scoping Report;
- Sending out personalised letters advising stakeholders of the availability of the DSR;
- Distribution of DSR to public places;
- Hold public meeting to obtain stakeholder feedback on the DSR;
- Compilation of the Final Scoping Report (FSR) and submission to authorities;
- Distribution of FSR to key stakeholders; and
- Sending out progress feedback letters to stakeholders.

2.2 Pre-application meeting and site visit with environmental authorities

Braamhoek Consultants Joint Venture (BCJV) proposes to hold a start-up meeting with officials from the DEAT KwaZulu-Natal, Free State and Head Office. The aim of this meeting is to establish a record of understanding between the parties, establish target dates for deliverables and obtain consensus on the process to be followed.

2.3 Submission of EIA application forms and Plan of Study for Scoping

The appropriate EIA application forms will be completed and submitted to the Regional DEAT officials as required by the EIA regulations. The Plan of Study for Scoping will also be completed and submitted to the authorities.

2.4 Stakeholder engagement in the Plan of Study phase

EIA announcements will be placed in various national and regional newspapers in at least two languages, as required by the EIA Regulations. At this stage it is envisaged that these announcements will be placed in the *Sunday Times*, *Rapport*, *Illanga*, *The Mercury*, *Ladysmith Gazette* and the *Harrismith Chronicle*. In addition to this, a Background Information Document will be prepared in at least two languages for distribution, and personalised letters will also be sent out to key stakeholders such as authorities.

Key stakeholder briefing sessions will be held with key stakeholders and traditional leaders. This will be followed by a press release in at least two languages in the broadcast media, and the compilation of an electronic stakeholder database.

2.5 Technical assessment of alternative routes

2.5.1 Proposed road alternatives

To implement and operate the Braamhoek PSS, there will be three levels of roads:

- Roads providing access to the scheme from existing regional roads i.e. “external” access roads;
- Roads linking the upper and lower reservoir sites i.e. “internal” access roads; and
- Roads providing access within the upper and lower reservoir sites, as well as within the campsites i.e. internal “site” roads.

These roads will be approximately 10 m wide, but will have a 30 m wide road reserve, and therefore a 30 m wide corridor of potential impacts on the environment. This will require road construction materials, which will be obtained from borrow pits. Trucks and other vehicles will use these roads during construction and operation of the of the scheme. Various route options are currently under investigation, as will be described below. A schematic of these various options is provided in **Figure 2.**

(a) External access roads

Site roads are required to link various components of the scheme for external access. To provide “external” access to the dam sites, existing roads can be utilised from the existing National Road (N3) at Swinburne in the north and from Regional Road 103 (R103) via Besters in the south. As existing roads will be utilised for external access, environmental impacts are expected to be minimal. The upgraded roads will be designed to mitigate environmental impacts.

A further option that could be considered for external access is to provide direct access from the N3 at Van Reenen. This option could eliminate a bridge over the Wilge River, that would be required on the De Beers Pass route if access is obtained from Swinburne.

(b) Internal access roads

There are essentially three options, some with minor variations, which will be investigated for internal access between the upper reservoir site (on the farm Bedford) and the lower reservoir (on the farm Braamhoek). The three options envisaged for investigation include:

- **Option A - Upgrade De Beers Pass and construct a new access road to the Upper Dam Site along the crest of the escarpment**

  This route follows existing KwaZulu-Natal provincial road 275 and De Beers Pass (D48), and an existing track along the crest of the escarpment. The section of new alignment along the crest of the escarpment will need to be subjected to detailed studies during the EIA process.

Table 1: Option A – Upgrade De Beers Pass with Escarpment Crest Link

Location	Figure 2 Reference	Provincial Road No	Length (km)
External Access Roads			
Swinburne to Uitvlught	A to R	S790	15,9
De Beers Pass (Uitvlugt to Trekboer)	R to E	S61 and D48	28,7
Besters to Trekboer	F to E	275 and D48	13,5
Internal Access Roads			
Escarpment Route (along Wilge River)	T to S	New	11,3
Lower Braamhoek Link	J to I	New	3,7
		TOTAL	**73,1**
Site Roads			
Upper Reservoir Site			6,6
Lower Reservoir Site	To dam wall		1,5
	Internal		10,2
		TOTAL	**18,3**

- **Option B – Construct new Braamhoek Pass**

This option requires the construction of a new road that will be privately owned by Eskom. The original ox-wagon route is approximately 20 km in length and has become totally overgrown with vegetation and parts of it are not visible on current aerial photography. The eastern end of this route coincides with the end of the proposed 'escarpment link'. Upgrading this pass to a usable condition will entail extensive cut and fill operations.

Table 2: Option B – Construct Braamhoek Pass

Location	Figure 2 Reference	Provincial Road No	Length (km)
External Access Roads			
Swinburne to Bedford Is A to B via escarpment to Bedford	A to B	S790 and S922	40,5
Braamhoek Pass	C to K	New	16,3
Besters to Trekboer	F to E	275 and D48	13,5
Internal Access Roads			
Trekboer to Braamhoek	F to E	D474	6,8
		TOTAL	**77,1**
Site Roads			
Upper Reservoir Site			6,6
Lower Reservoir Site	To dam wall		1,5
	Internal		10,2
		TOTAL	**18,3**

- **Option C – Upgrade De Beers Pass and provide access to the Dam Sites along existing roads**

This option almost entirely utilises existing roads for external access and should have minimal environmental impact.

This option includes implementing a link from Swinburne, making use of existing gravel roads, and then the De Beers Pass and the proposed 'escarpment crest link'. This route follows Free State provincial road S790 up to Kiesbeen and then S61 through De Beers Pass. From the top of De Beers Pass the route follows a KwaZulu-Natal provincial road D48. This alternative may be favoured by the local community because it would result in the upgrading of roads currently used by them. However, travel distance between the reservoir sites is some 26 to 30 km longer than either Option A or B, which is detrimental during operation of the scheme.

Table 3: Option C – Upgrade De Beers Pass with Existing Road Links

Location	Figure 2 Reference	Provincial Road No	Length (km)
External Access Roads			
Swinburne to Bedford	A to B	S790 and S922	40,5
De Beers (Uitvlugt to Trekboer)		S61 and D48	28,7
Besters to Trekboer	F to E	275 and D48	13,5
Internal Access Roads			
Lower Braamhoek Link	J to I		3,7
		TOTAL	**86,4**
Site Roads			
Upper Dam Site			6,6
Lower Dam Site	E to I		1,5
	Internal		10,2
		TOTAL	**18,3**

The approximate travel lengths between the upper and lower reservoir sites for the three options are tabulated below:

Table 4: Travel Distance Upper and Lower Dam Sites for Route Options

Option	Description	Length (kms)
A	De Beers Pass and Escarpment Road	23,8
B	Braamhoek Pass	16,5
C	De Beers Pass and Existing Provincial Roads	50,1

(c) Internal site roads

The following surfaced internal roads will be required to provide access to the various components of the scheme in addition to the main access roads described above:

1. Approximately 18 km of road at the lower reservoir site, comprising:

- An entrance road;
- Access to the contractors' camp;
- Access to the lower dam wall;
- Access to the outfall structure;
- Access to the main access tunnel entrance;
- Access to the surge chamber access tunnel entrance; and
- Access to the exploratory tunnel entrance.

2. Approximately 7 km of road at the upper reservoir site, comprising:

- An entrance road;

- Access to the upper dam wall;
- Access to the intake structure;
- Access to the surge shaft; and
- Access to the site buildings.

These roads will all need to be constructed and would be privately owned by Eskom.

2.5.2 Assessment of road alternatives

Existing roads shall be utilised wherever possible. The project team will investigate the various alternatives described above and will evaluate these routes by taking into account the following:

(i) Environmental factors:

- Gradient and slope;
- Fauna and flora;
- Watercourses;
- Wetlands
- Dams;
- Land-use;
- Aesthetic effects;
- The potential for soil erosion and sedimentation of watercourses;
- Socio-economic factors; and
- Issues raised by IAPs.

(ii) Logistical factors:

- Distance;
- Haulage time; and
- Accessibility of route.

(iii) Cost factors:

- Cost of the road construction and maintenance; and
- Transportation costs.

All watercourses, wetlands and other sensitive areas will be mapped. These sensitive areas will be avoided wherever possible when selecting possible routes. The preferred route will be selected using an objective comparison of all the proposed routes and by ranking them according to their potential impacts and costs.

2.5.3 Identification of potential environmental and socio-economic impacts

The project team will identify the potential environmental and socio-economic impacts on the following:

- Fauna and flora;
- Surface water;
- Air quality;
- Landuse;

- Soils and soil erosion;
- Aesthetic value of the area;
- Ambient noise levels;
- Socio-economic conditions;
- Cultural artefacts or graves; and
- Issues raised by IAPs.

2.6 Compilation of the Draft Scoping Report (DSR)

Section 3.2.3.1 of the "Guideline Document: EIA Regulations – Implementation of Sections 21, 22 and 26 of the Environmental Conservation Act (April 1998)" issued by the Department of Environmental Affairs and Tourism: Sub-Directorate Environmental Impact Management contains a suggested format for Scoping Reports. The format suggested below is consistent with this approach.

The DSR will include the following components:

- A brief description of the project, the various alternatives and the affected environment;
- A brief description of how the environment could be affected by the project proposals;
- A description of the environmental issues identified during the consultation process;
- A description of the consultation process;
- A technical assessment of the various road alternatives and of the potential environmental and socio-economic impacts; and
- Conclusions and recommendations on the way forward.

2.7 Compilation of the Final Scoping Report (FSR)

The DSR will be updated with IAP's written comments received during the Comments Period. Thereafter, the FSR will be submitted to the KwaZulu-Natal and Free State Regional offices for formal consideration.

2.8 Stakeholder engagement in the Scoping Phase

A key stakeholder workshop will be held and an issues report will be compiled for inclusion into the Draft Scoping Report (DSR). The DSR will then be made available for public review in public places. In addition to this, the availability of the DSR will be advertised and individual letters will be sent out to registered stakeholders. A public meeting will be held after the public and registered stakeholders have reviewed the DSR in order to obtain their feedback. This feedback will be used to compile the FSR as discussed above.

Upon completion of the FSR, copies will be sent to selected stakeholders, such as the relevant authorities. In addition to this, a progress feedback letter will be sent to all registered stakeholders.

2.9 Integration with transmission line EIA

The EIA for the transmission lines and associated infrastructure for the Braamhoek PSS will be conducted by Margen Industrial Services. Acer Africa will be responsible for the public participation processes for both EIAs, and this provides the potential opportunity to share public meetings and briefing sessions. The BCJV environmental project team for this EIA will also participate in monthly project meetings with Eskom where both EIA processes will be discussed and both consultants will be present. Where possible, these two processes will be overlapped.

2.10 Scoping Phase schedule

We estimate that the Scoping Study will take 7 months and envisage the submission of the DSR by April 2005.

2.11 Conclusion

This plan of study is aimed at meeting the requirements of the EIA Regulations as a minimum, and achieving the objectives of the Scoping Phase in identifying potential environmental impact and stakeholder concerns.

We trust that the above will meet with your approval. Should you have any queries please contact either Jaana-Maria Ball (0836505489; jball@gibb.co.za) or Joanna Goeller (0839912969; joannag@kprsa.co.za).

Yours sincerely

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DOCUMENT CONTROL SHEET

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PROJECT : Braamhoek Pumped Storage Scheme **PROJECT No : 460011104**

TITLE : Plan of Study for Scoping – Roads EIA

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