

EXECUTIVE SUMMARY: FINAL BASIC ASSESSMENT REPORT

ESKOM BATTERY STORAGE SYSTEM AT PALEISHEUWEL SUBSTATION, PALEISHEUWEL, WESTERN CAPE

This Executive Summary is identical in most respects to the previous version. Changes made to the Executive Summary are underlined and italicised for ease of reference.

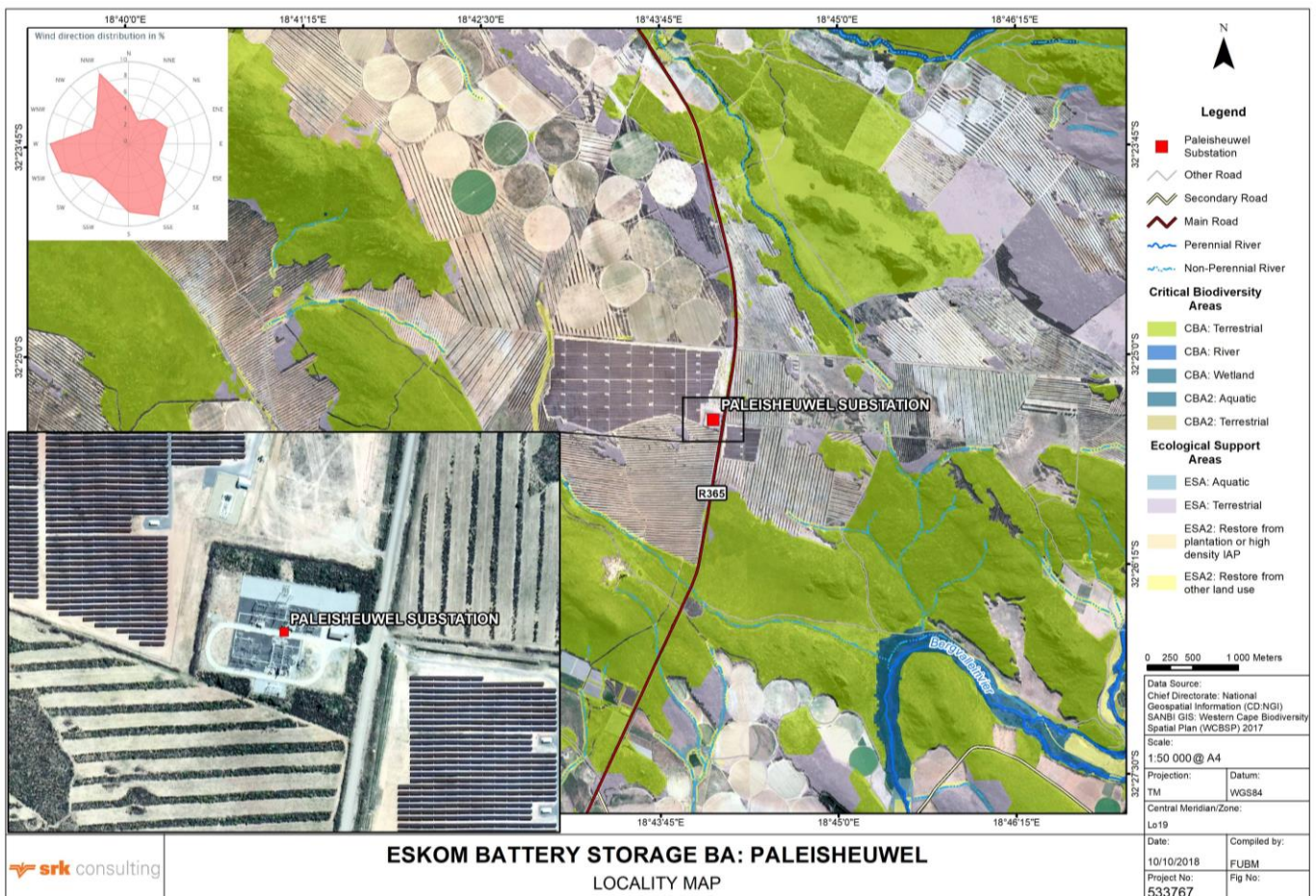
1 INTRODUCTION

Eskom Holdings SOC Limited (Eskom) proposes to install a Battery Energy Storage System (BESS) at the existing Paleisheuvel Substation located adjacent to the Paleisheuvel Solar Photovoltaic (PV) Plant in the Cederberg Local Municipality (Figure 1). The BESS will:

- Strengthen the electricity distribution network and address current voltage and capacity constraints;
- Integrate a greater amount of renewable energy from the Paleisheuvel Solar PV Plant into the electricity grid; and
- Reduce the requirement for investment in new conventional generation capacity (i.e. gas, nuclear, coal) and new distribution substations and powerlines to strengthen networks.

SRK Consulting (South Africa) Pty Ltd (SRK) has been appointed by Eskom to undertake the Basic Assessment (BA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA). The BA process was undertaken in accordance with Section 23 of the Environmental Impact Assessment Regulations, 2014 (GN R982, as amended by GN R326).

See page 5 for details on how you can participate in the process.



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Revision: A Date: 11/10/2018

Figure 1: Locality Plan

2 GOVERNANCE FRAMEWORK

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA) issued by the competent authority, in this case, the National Department of Environment, Forestry and Fisheries (DEFF). The EIA Regulations, 2014, promulgated in terms of NEMA, govern the process, methodologies and requirements for the undertaking of EIAs in support of EA applications. The EIA Regulations are accompanied by Listing Notices (LN) 1-3 that list activities that require EA.

The EIA Regulations, 2014, lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a BA process or a Scoping and Environmental Impact Reporting (S&EIR) process is required to obtain EA. LN 1 lists activities that require a BA process, while LN 2 lists activities that require S&EIR. LN 3 lists activities in certain sensitive geographic areas that require a BA.

SRK has determined that the proposed project triggers an activity listed in terms of LN 1 of the EIA Regulations, 2014, requiring a BA.

Table 1: Listed activities triggered by the project

No	Description
LN 1 (requiring BA)	
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 m ³ or more but not exceeding 500 m ³ .

3 ENVIRONMENTAL PROCESS

The EIA Regulations, 2014, define the detailed approach to the BA process (see Figure 2).

The objectives of the BA process are to:

- Identify relevant authorities and key stakeholders to engage in the stakeholder engagement process;
- Disclose information to authorities and stakeholders and provide them with an opportunity to raise issues or concerns;
- Identify potential issues and environmental impacts;
- Assess the significance of the potential environmental impacts identified;
- Describe and investigate alternatives that have been and / or could be considered; and
- Provide feasible mitigation measures to address any significant impacts identified.

These objectives are achieved through technical evaluation of the proposed activity, the stakeholder engagement

process and submission of the relevant documentation to DEFF.

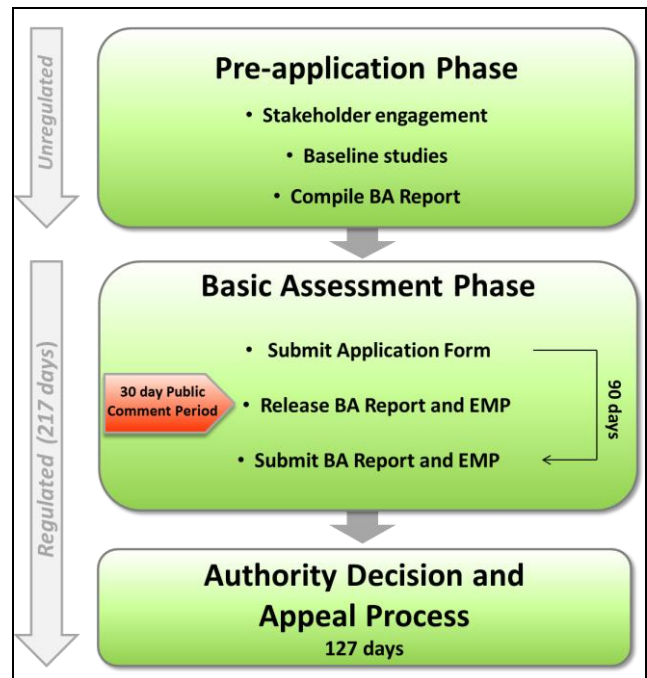


Figure 2: BA Process

4 DESCRIPTION OF THE SITE AND ENVIRONMENT

The Paleisheuvel Substation (Figure 3) is located adjacent to the Paleisheuvel Solar PV Plant. Besides the Paleisheuvel Solar PV Plant, which has a capacity of 75 MW and extends over ~ 200 ha, extensive agriculture is the primary land use in the study area, although tourism is of increasing significance in the region. The closest town to the Paleisheuvel Solar PV Plant is Redelinghuys (approximately 20 km south-west of the Substation). The study area is largely rural and dominated by agriculture and associated industries and services. Rooibos, potato and lucerne are the predominant crops surrounding the site.

Isolated farmsteads are scattered throughout the surrounding area. An extensive network of sandy/gravel farm roads connect the various farms.

Access to the Paleisheuvel Substation is via the R365, which continues north to Lamberts Bay and south to Portersville.

The study area falls within the Fynbos Biome and the Leipoldtville Sand Fynbos vegetation type (Figure 4), listed as *Endangered*. According to the Western Cape Biodiversity Spatial Plan, the site intersects an Ecological Support Area (ESA) although much of the site is transformed and only pockets of natural vegetation remain.

During the field survey, one plant Species of Conservation Concern (SCC) (*Leucospermum rodolentum*) and four provincially protected species protected were observed on

site (*Amaryllidaceae spp., Apocynaceae spp., Mesembryanthemaceae spp. and Proteaceae spp.*).



Figure 3: The Paleisheuwel Substation



Figure 4: Strip of natural vegetation adjacent to the Substation

5 PROJECT DESCRIPTION

Eskom proposes to install a BESS at the existing Paleisheuwel Substation primarily because of:

- Location – the BESS will be located within the Paleisheuwel Substation adjacent to the Paleisheuwel Solar PV Plant, a renewable energy project;
- Land Ownership - Eskom owns the property and therefore does not need to acquire new land, reducing the cost of connection to evacuate into the grid; and
- Security – because the BESS will feed directly from the Paleisheuwel Solar PV Plant, Eskom needs to ensure security from vandals, theft, external accidents, etc.

10 MW of electricity storage is required at Paleisheuwel Substation.

Individual platforms will be constructed adjacent to the Substation to accommodate the BESS containers (see example of a BESS, Figure 5). The total footprint of the battery storage area to be installed is ~0.8 ha. All batteries will be located within the fenced property boundary of the Substation.

The construction of the BESS will include:

- Earthworks - cutting to create a level platform;
- Construction of stormwater management infrastructure;
- Installation of an earth protection layer; and
- A stone chip finishing layer to match existing at the Substation.

Fill (if required) and stone chip will be sourced from local licensed quarries.

Clearance of indigenous vegetation will be required to construct the platforms and accommodate laydown areas.



Figure 5: Example of a BESS

Dangerous goods will be stored on site during the construction and operation phases (see Table 2 below).

Table 2: List of dangerous goods stored on site

<u>Dangerous Good</u>	<u>Volume</u>	<u>Storage Infrastructure</u>
<u>Construction Phase</u>		
<u>Fuel (petrol and diesel)</u>	<u>1 m³</u>	<u>Fuel tanks / bowsers</u>
<u>Operational Phase</u>		
<u>Chemical electrolyte</u>	<u><500 m³</u>	<u>Battery cells</u>

6 Alternatives

Appendix 1 Section 3 (h)(i) of the EIA Regulations, 2014, requires that all BA processes must identify and describe feasible and reasonable alternatives. Eskom is considering two BESS **technology alternatives** for battery storage:

- **Technology Alt. 1:** Self-contained (solid state) batteries (Figure 6); and
- **Technology Alt. 2:** Flow batteries (Figure 7).

A single battery technology or combination thereof will be implemented at Paleisheuwel. The chemical composition of the BESS can be hazardous (typically comprised of a blend of one or more of the hazardous substances listed in SANS 10234), and the batteries will therefore be stored in intermodal containers (or similar) in a bunded area. The design capacity of the BESS to store dangerous goods will not exceed 500 m³.



Figure 6: Solid state battery module



Figure 7: Flow battery storage container

Eskom is proposing two **layout alternatives**:

- **Layout Alt. 1:** BESS housed inside a building/ shed; and
- **Layout Alt. 2:** Stand-alone Containerized Battery Units (unhoused).

The **No-Go alternative** will be considered in the BAR in accordance with the requirements of the EIA Regulations, 2014. The No-Go alternative entails no change to the *status quo*, in other words, the proposed BESS and associated infrastructure will not be built and the opportunity to optimize energy supply and demand will be forgone.

7 ASSESSMENT OF POTENTIAL IMPACTS

Potential impacts associated with the projects were assessed according to SRK’s standard Impact Assessment methodology. For all potentially significant impacts, the significance of the anticipated impact was rated without and with recommended mitigation measures. These impacts are presented in Table 2, which summarises:

- The impacts assessed in the BA Report (BAR); and
- Their significance without and with mitigation.

Impact Significance Ratings Legend:

Rating	+ve	-ve
Insignificant	I	I
Very Low	VL	VL
Low	L	L
Medium	M	M

High	H	H
Very High	VH	VH

The assessment of impacts on vegetation was informed by a specialist investigation undertaken by Nemaï Consulting in August 2019.

Table 2: Summary of Impacts

Impact	Significance rating	
	Without	With
CONSTRUCTION PHASE IMPACTS		
Deterioration of Groundwater Quality from Accidental Hydrocarbon Spills	I	I
Deterioration of Groundwater Quality from Accidental (non-routine) Electrolyte spills	Technology Alternative 1	
	I	I
	Technology Alternative 2	
	VL	VL
Loss of Vegetation and Plant SCC	L	L
Loss of Ecological Connectivity	VL	I
Increased Employment, Income and Skills Development	VL	VL
Impaired Human Health from Increased Ambient Pollutant Concentrations	VL	I
Altered sense of place and visual intrusion	VL	VL
Altered Sense of Place from Increased Traffic during Construction	VL	VL
Increased Nuisance on Existing Road Users and Surrounding Residents	VL	I
Compromised Road Surface Integrity of the Regional Road Network	L	VL
OPERATIONAL PHASE IMPACTS		
Deterioration of Groundwater Quality from Accidental (non-routine) Electrolyte spills	Technology Alternative 1	
	VL	VL
	Technology Alternative 2	
	VL	VL
Loss of Vegetation and Plant SCC	Technology Alternative 1	
	L	VL
	Technology Alternative 2	
	L	VL
Human fatalities / injuries caused by battery fires / explosions	Technology Alternative 1	
	M	M
	Technology Alternative 2	
	M	M
Altered sense of place and visual intrusion	Layout Alternative 1	
	L	VL
	Layout Alternative 2	
	L	VL

Key recommendations, which are considered essential, are:

- Implement the Environmental Management Programme (EMPr) to guide construction, operation and maintenance activities and to provide a framework for the ongoing assessment of environmental performance;

- Appoint an Environmental Control Officer (ECO) to oversee the implementation of the EMPr and supervise any construction activities;
- Implement the Stormwater Management Plan;
- Implement measures to reduce the risks of accidental events (e.g. electrolyte spills and battery fires/explosions).

8 FINDINGS AND RECOMMENDATIONS

The most notable impacts of the project relate to the loss of vegetation and plant SCC and the potential impact on human health. However, none of the impacts associated with the project are considered unacceptably significant and all can be managed to tolerable levels through the effective implementation of the recommended mitigation measures.

Given the comparison of alternatives (Table 2), implementation of Technology Alternatives 2 and Layout Alternative 2 are supported by the EAP, *although all alternatives are deemed acceptable and feasible.*

Noting that the project is an important strategic project that will allow Eskom to strengthen the electricity distribution network and address current voltage and capacity constraints, SRK is of the opinion that, on purely 'environmental' grounds (i.e. the project's potential socio-economic and biophysical implications) the application as it is currently articulated should be approved, provided the essential mitigation measures are implemented.

9 STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a key component of the BA process and is being undertaken in accordance with the requirements of the EIA Regulations, 2014. The stakeholder engagement activities are summarised in Table 3.

Relevant local, provincial and national authorities, conservation bodies, local forums and surrounding landowners and occupants have been notified of the BA process and the release of the BAR for comment.

The release of the draft BAR for public review was communicated to all identified stakeholders by post, email or fax on or by 29 August 2019. Hard copies of the full report were placed at the following venues:

- Redelinghuys and Piketberg Public Libraries; and
- SRK's office in Rondebosch, Cape Town.

Hard copies of the draft BAR were sent to various Organs of State on 29 August 2019 for comment.

DEFF was notified that the reports were sent to the organs of state listed above to request their comment.

Stakeholders were provided with a 30-day comment period until 30 September 2019.

Copies of the adverts, notification email and letters and the posters are provided in Appendix D of the Final BAR.

Following initial review of the BAR, issues raised by authorities and the public were summarised and responded to in an Issues and Responses Summary (see Appendix D of the Final BAR). The Final BAR was updated (where necessary) taking stakeholder input into account. The Final BAR will then be submitted to the DEFF for decision making. IAPs will be informed of the submission of the Final BAR to the DEFF, including the Issues and Responses Summary.

The main issues raised by stakeholders on the contents of the BAR are:

1. Clarity is required on the nature and volume of dangerous goods that will be stored on site; and
2. The project will result in the loss of Endangered habitat and SCC.

10 WAY FORWARD

The public participation process conducted to date has given stakeholders the opportunity to assist with the identification of issues and potential impacts, and to submit their comments. Comments have been incorporated into the Final EIA Report, which is now being submitted to DEFF.

