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# BOSA

TRANSMISSION PROJECT

## APPENDIX 4

WATER RESOURCES MANAGEMENT PLAN  
REVISION 1.0

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## List of Acronyms

<b>BOSA</b>	Botswana-South Africa	<b>ESIA</b>	Environmental and Social Impact Assessment
<b>BPC</b>	Botswana Power Corporation	<b>ESMP</b>	Environmental and Social Management Plan
<b>DBSA</b>	Development Bank of Southern Africa	<b>IFC</b>	International Finance Corporation
<b>DEA</b>	Department of Environmental Affairs	<b>DBSA</b>	Development Bank of Southern Africa
<b>ECO</b>	Environmental Control Officer	<b>NWA</b>	National Water Act (Act No. 36 of 1998)
<b>EO</b>	Environmental Officer	<b>SAPP</b>	Southern African Power Pool
<b>DWS</b>	Department of Water and Sanitation	<b>NEMA</b>	National Environmental Management Act

## Glossary of Terms

*Definition of terms provided in the National Water Act (Act No. 36 of 1998)*

<b>Pollution</b>	means the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it - (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or
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- (b) harmful or potentially harmful -
  - (aa) to the welfare, health or safety of human beings;
  - (bb) to any aquatic or non-aquatic organisms;
  - (cc) to the resource quality; or
  - (dd) to property;

**Watercourse**

means -

- (a) a river or spring;
- (b) a natural channel in which water flows regularly or intermittently;
- (c) a wetland, lake or dam into which, or from which, water flows; and
- (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;

**Water resource**

includes a watercourse, surface water, estuary, or aquifer

## INTRODUCTORY NOTE

This plan has been prepared in terms of the requirements of the Department of Environmental Affairs (DEA) in their acceptance of the Final Scoping Report prepared for the proposed Botswana-South Africa (BOSA) Transmission Interconnection Project (the “Project”) to alleviate the current electricity supply constraints and contribute towards energy security of supply in the long run by enhancing the distribution of electricity in the region.

This Plan must be read in conjunction with the ESMP and should be implemented throughout the lifecycle of the project and/or where relevant. In terms of implementation, the Developer (Eskom or BPC) will be responsible for appointing a qualified Environmental Control Officer (ECO) to visit the site as stipulated in the ESMP to ensure implementation of this plan and other relevant authorisations and permits. A copy of this Plan must be maintained on site, and all the Contractor’s employees working at the site, including sub-contractors must be trained to ensure compliance with this Plan. Changes to the Plan must be approved by the ECO, and updates and reasons for the changes incorporated into the plan.

# SECTION 1

## 1 Introduction

### 1.1 Background to the Project

The Southern African Power Pool (SAPP) has identified the Botswana-South Africa (BOSA) Transmission Interconnection Project as one of the energy pool initiatives to alleviate the current electricity supply constraints and contribute towards energy security of supply in the long run between South African and Botswana. Given the transborder nature of the project, both Eskom of South Africa and the Botswana Power Corporation (BPC) will subsequently be the beneficiaries of the project. The proposed transmission line stretches between the Mahikeng area in South Africa and Gaborone in Botswana for approximately 210 km.

The subject of this Plan is Water Resources Management for the project.

### 1.2 Purpose and Scope

The water management plan is intended to identify and implement water use strategies in order to protect the water resources from construction-related impacts.

The **scope** of the plan includes:

- Identification of water-related impacts on site;
- Provide strategies or measures to be implemented during the construction phase of the project to minimise the impacts on water resources within the vicinity of the construction area; and
- Ensure compliance with water and environmental legislative requirements.

### 1.3 Objectives

To guide the means by which the Contractor will ensure the following:

- To prevent impacts on water resources by appropriately managing works close to wet areas;
- To prevent the contamination of aquatic resources through the disturbance or inappropriate disposal of sediment or substances;
- Ensure the quality and quantity of the water in the nearby streams are not compromised in any way; and
- Manage the usage of local water resources.

### 1.4 Major sources of water impacts

Surface water along the site includes rivers such as the Ngotwane, Sandloot and Brakfonteinspruit Rivers amongst other natural drainage lines, wetlands and artificial water features. Working in close proximity to surface water means that discharges of waste water or releases of contaminated storm water pose a risk to the integrity of such surface water. The activities that may invoke the risk of both surface and ground water impacts must be effectively managed and controlled to minimise or prevent such impacts.

The specific activities of the construction phase which are or may result in water pollution or misuse include:

- Site preparation, earthworks and other construction activities near watercourses;

- Vegetation clearing (including removal of riparian vegetation);
- Topsoil and subsoil stockpiling;
- Inappropriate disposal of waste waters from site amenities; and
- Run off from areas exposed to contamination or stockpiles; and
- Abstraction of water from unauthorised sources.

## SECTION 3

### 2 Water Quality and Quantity Management

The table below presents a summary of the potential environmental impacts related to water quality and quantity, together with mitigation and management measures to mitigate such impacts.

**Table 1: Water resources aspects and impacts with associated objectives and mitigation measures**

ASPECT	POTENTIAL IMPACTS	MITIGATION MEASURES	PERFORMANCE INDICATORS/ TARGETS OUTCOMES	PROJECT PHASE	APPLICABLE PLANS, POLICIES & PROCEDURES	RESPONSIBLE PERSON	REPORTING, MONITORING AND AUDITING REQUIREMENTS
Surface and ground water quality	<p>Impact on the wellbeing and reproduction potential of the aquatic biota.</p> <p>Potential decrease in surface- and ground water quality.</p> <p>Potential decline in the use of water for activities on site.</p> <p>Increased flood risk and surface water run-off</p>	<ul style="list-style-type: none"> <li>All water courses and 32m buffer from be excluded from any construction disturbance, thus no towers or new tracks should occur within these systems, i.e. only the cables must span the aquatic system</li> <li>Littering and contamination of water sources during construction must be prevented by effective construction camp management</li> <li>No stockpiling should take place within a water course</li> <li>Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed riverbanks</li> <li>Wash bays, service areas, toilets and fuel storage areas may not be located within the 1:100 year flood line or within 100 m (whichever is greater) of a watercourse or drainage line.</li> <li>Best practice measures to control vehicle wash discharges, and ensure the washing facilities are securely constructed with no overflow</li> <li>The Contractor shall supply a wastewater management system that will</li> </ul>	<ul style="list-style-type: none"> <li>The quality of the water from upstream of construction and downstream of construction will not differ with more than 10%.</li> <li>No evidence of pollutants released into streams and rivers and/or ground water.</li> <li>No evidence of erosion and sedimentation caused by construction activities.</li> </ul>	<b>CONSTRUCTION &amp; DECOMMISSIONING</b>	<p><b>International:</b></p> <ul style="list-style-type: none"> <li>IFC EHS General Guidelines (2007), Section 1.3 Wastewater and Ambient Water Quality</li> <li>IFC EHS General Guidelines (2007), Section 3.1 – Water Quality and Availability</li> <li>IFC EHS General Guidelines (2007), Section 4.1 – Environment: Wastewater Discharge</li> </ul> <p><b>South Africa</b></p> <ul style="list-style-type: none"> <li>National Water Act (Act No. 36 of 1998)</li> <li>National Environmental Management Act (Act No. 107 of 1998)</li> </ul> <p><b>Botswana</b></p> <ul style="list-style-type: none"> <li>Water Act (Cap. 34:01 of 1968)</li> </ul>	<p><b>Implementation:</b></p> <p>Contractor and EO</p> <p><b>Verification</b></p> <p>Site Manager and ECO</p>	<p><b>Reporting:</b></p> <ul style="list-style-type: none"> <li>Evidence of water pollution or contamination must be reported by all personnel to the Site Manager or EO immediately.</li> </ul> <p><b>Monitoring frequency:</b></p> <ul style="list-style-type: none"> <li>The Contractor should undertake daily inspections of their activities that might potentially impact water resources and ensure there are adequate mitigation measures in place.</li> </ul> <p><b>Auditing requirements:</b></p> <ul style="list-style-type: none"> <li>Implementation of this Plan shall be audited at the commencement of works and on a quarterly basis throughout construction works.</li> <li>An independent ECO must be appointed to undertake site verification audits/ inspections on a monthly basis. Audit reports will be submitted to the client and relevant Competent Authority as and when required.</li> </ul> <p><b>Training:</b></p> <ul style="list-style-type: none"> <li>The Contractor must ensure that all personnel are trained about the requirements of this Plan and they are competent to identify and respond to impacts associated with water resources.</li> </ul> <p><i>(Refer to Section 5 of the ESMP for the detailed information on the training programmes and requirements).</i></p>



ASPECT	POTENTIAL IMPACTS	MITIGATION MEASURES	PERFORMANCE INDICATORS/ TARGETS OUTCOMES	PROJECT PHASE	APPLICABLE PLANS, POLICIES & PROCEDURES	RESPONSIBLE PERSON	REPORTING, MONITORING AND AUDITING REQUIREMENTS
		<p>comply with legal requirements and be approved by the Engineer.</p> <ul style="list-style-type: none"> <li>• Workshops, refuelling depots and washing areas shall be bunded to contain potential spillages. [refer to <b>Spill Prevention and Response Plan in App 8: Construction Material Management Plan</b>]</li> <li>• No drainage from fuel storage areas shall be permitted.</li> <li>• No discharge of any sewage and/or wastewater to surface waters without treatment and a permit from the relevant department</li> <li>• Any contaminated storm water and other run-off from the site shall be contained.</li> <li>• The batching plant area shall be operated in such a way as to prevent contaminated water to run-off the site, polluting nearby streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a catchment area.</li> <li>• Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or streams.</li> <li>• Where possible, deflect any unpolluted water/runoff away from any dirty areas.</li> <li>• No roads shall cut through river- and stream banks except where duly authorised by a water use license as this may lead to erosion causing siltation of streams and downstream dams. Where such roads are constructed in wet areas,</li> </ul>		<p style="text-align: center;"><b>CONSTRUCTION &amp; DECOMMISSIONING</b></p>			



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		<p>adequate erosion and sedimentation prevention measures must be applied.</p> <ul style="list-style-type: none"> <li>• A licence must be acquired from DWS for any activities crossings within 500m of the watercourses before construction starts.</li> <li>• During construction through a drainage line, the majority of the flow must be allowed to pass down the stream. In-stream diversions should be used rather than the construction of new channels. The activities should not obstruct the flow of water or aquatic life.</li> <li>• Bank destabilisation, vegetation removal and erosion must be minimised.</li> <li>• Erosion sensitive zones shall be clearly marked and avoided where possible.</li> <li>• Impacts on the watercourses must be rehabilitated after construction.</li> <li>• Where there are activities in built up areas with municipal systems in place, the storm water drains must be covered (i.e. with geotextile fabric) to prevent contaminants washing down the stormwater drains.</li> <li>• Where feasible, avoid vegetation stripping immediately prior to or during rainy seasons</li> <li>• Re-vegetate cleared areas immediately.</li> <li>• Provide temporary surface water drainage or sediment traps where necessary.</li> </ul>					
Surface and ground water quantity	Decrease in the effective functioning of the aquatic biota.	<ul style="list-style-type: none"> <li>• Where practical, wastewater is to be reused (i.e. for dust suppression)</li> </ul>	<ul style="list-style-type: none"> <li>• No water abstraction from unauthorised sources.</li> </ul>		<p><b>International:</b></p> <ul style="list-style-type: none"> <li>• IFC EHS General Guidelines (2007),</li> </ul>	<p><b>Implementation:</b></p> <p>Contractor and EO</p>	<p><b>Reporting:</b></p> <ul style="list-style-type: none"> <li>• Unauthorised usage of water from a natural source must be reported by all personnel to the Site Manager or EO immediately.</li> </ul>

ASPECT	POTENTIAL IMPACTS	MITIGATION MEASURES	PERFORMANCE INDICATORS/ TARGETS OUTCOMES	PROJECT PHASE	APPLICABLE PLANS, POLICIES & PROCEDURES	RESPONSIBLE PERSON	REPORTING, MONITORING AND AUDITING REQUIREMENTS
	Decrease availability of water for downstream users of the water course	<ul style="list-style-type: none"> <li>No water may be abstracted from a water course for use during construction without a water use licence.</li> <li>Do not drain, fill or alter in any way, any drainage line, including the riverbanks unless this forms part of the construction works, or upon specific instruction by the engineer and as authorised by the water use license.</li> </ul>	<ul style="list-style-type: none"> <li>No diversion or impeding of the natural flow regime.</li> </ul>	<b>CONSTRUCTION &amp; DECOMMISSIONING</b>	<p>Section 1.4 – Water Conservation</p> <ul style="list-style-type: none"> <li>IFC EHS General Guidelines (2007), Section 3.1 – Water Quality and Availability</li> <li>IFC EHS General Guidelines (2007), Section 4.1 – Environment: Wastewater Discharge</li> </ul> <p><b>South Africa</b></p> <ul style="list-style-type: none"> <li>National Water Act (Act No. 36 of 1998)</li> <li>National Environmental Management Act (Act No. 107 of 1998)</li> </ul> <p><b>Botswana</b></p> <ul style="list-style-type: none"> <li>Water Act (Cap. 34:01 of 1968)</li> </ul>	<p><b>Verification</b></p> <p>Site Manager and ECO</p>	<p><b>Monitoring frequency:</b></p> <ul style="list-style-type: none"> <li>The usage and/or abstraction of water from natural resources shall be monitored by the Contractor on a daily basis.</li> </ul> <p><b>Auditing requirements:</b></p> <ul style="list-style-type: none"> <li>Implementation of this Plan shall be audited at the commencement of works and on a quarterly basis throughout construction works.</li> <li>An independent ECO must be appointed to undertake site verification audits/ inspections on a monthly basis. Audit reports will be submitted to the client and relevant Competent Authority as and when required.</li> </ul> <p><b>Training:</b></p> <ul style="list-style-type: none"> <li>The Contractor must ensure that all personnel are trained about the requirements of this Plan and they are competent to identify and respond to impacts associated with water resources.</li> </ul> <p><i>(Refer to <b>Section 5</b> of the ESMP for the detailed information on the training programmes and requirements).</i></p>