1 INTRODUCTION

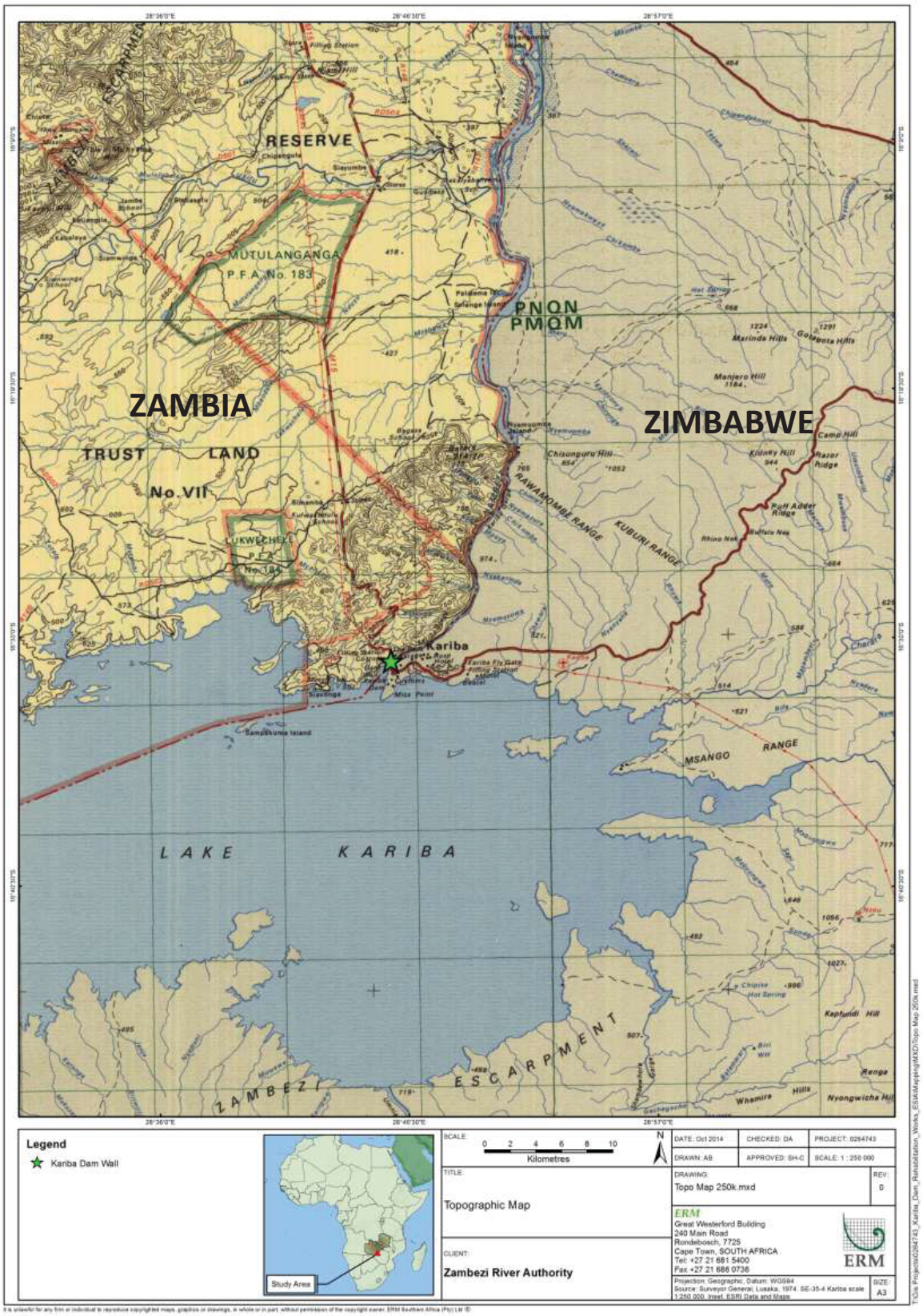
1.1 TERMS OF REFERENCE

The Zambezi River Authority (ZRA) has appointed Environmental Resources Management Southern Africa (Pty) Ltd (ERM) in partnership with Black Crystal Consulting (Pvt) Ltd (Zimbabwe), as independent environmental consultants to undertake the Environmental and Social Impact Assessment (ESIA) process for the proposed Kariba Dam Rehabilitation Works. The dam is located on the Zambezi River on the border of Zambia and Zimbabwe and is managed by the ZRA. During the last 20 years, the sluices which make up the spillway have undergone ageing effects, as well as severe erosion within the plunge pool area. The Kariba Dam Rehabilitation Works will consist of excavation works within the plunge pool to stabilise the foundation of the dam wall, as well as refurbishment works to the spillway.

1.2 PROJECT BACKGROUND

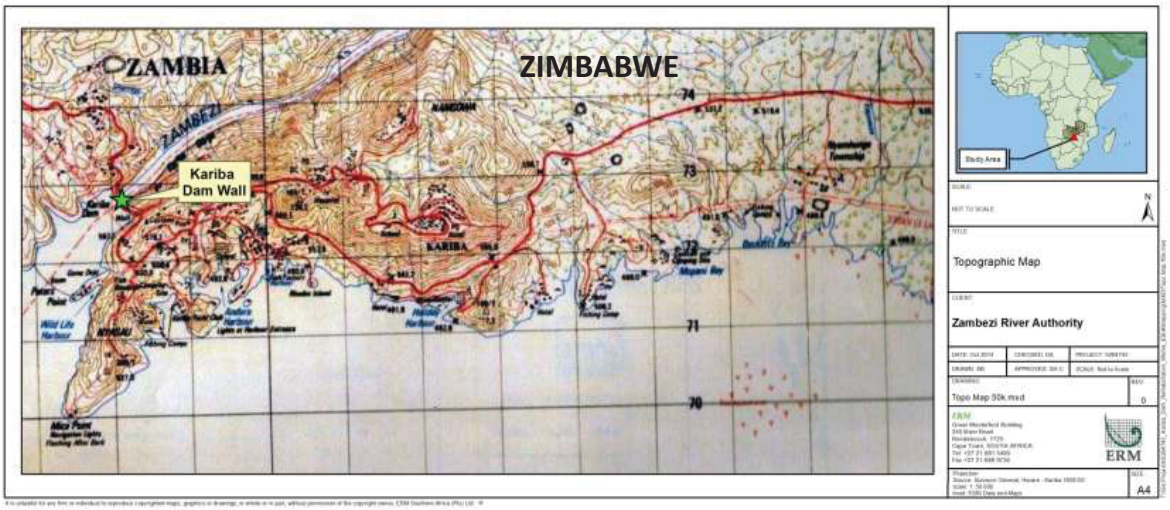
The Kariba Dam is a double curvature concrete arch dam located at 16°31′18″S 28°45′41″E in the Kariba Gorge of the Zambezi River Basin between Zambia and Zimbabwe (*Figure 1.1* and *Figure 1.2*). The arch dam was constructed between 1956 and 1959 and supplies water to two underground hydropower plants located on the north bank in Zambia and on the south bank in Zimbabwe (refer *Figure 1.3*). The north bank power station was commissioned in 1960 and the south bank power station in 1976.

Figure 1.1 Kariba Dam Location 1:250 000 Scale



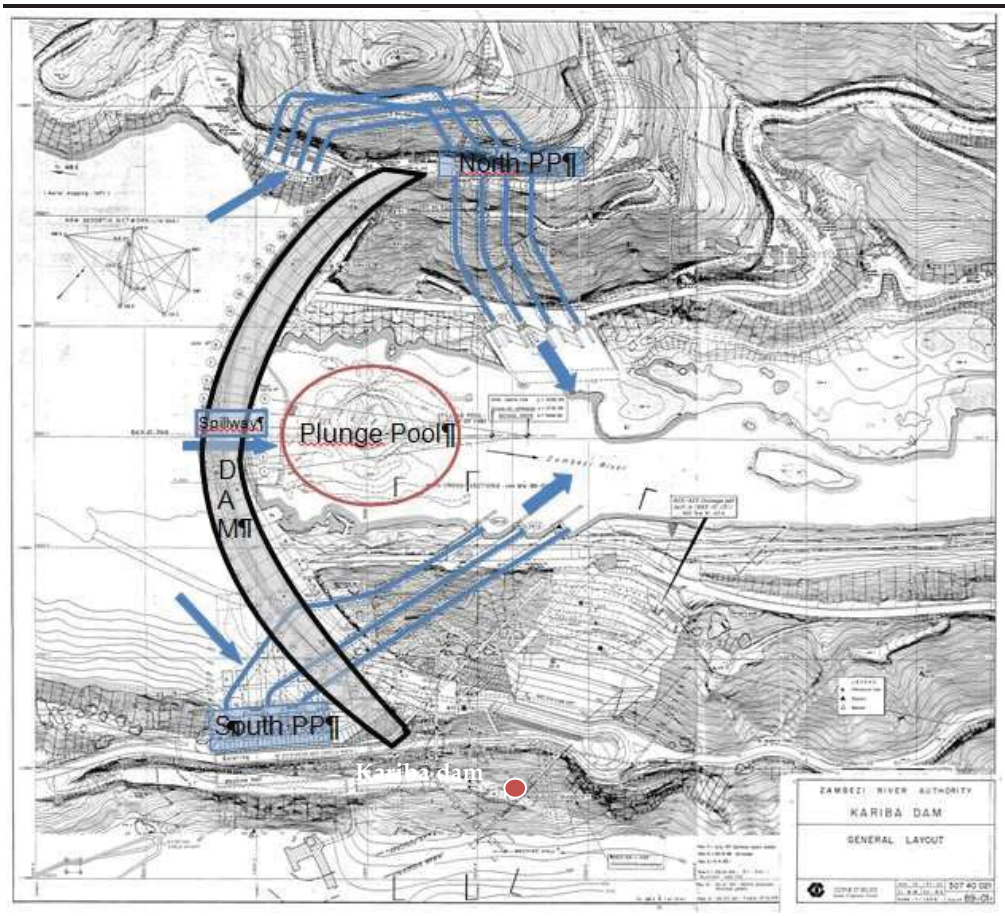
Projection: Geographic, Datum: WGSB4
Source: Surveyor General, Lusaka, 1974, SE-35-4 Kariba scale
1:250 000. Inset: ESRI Data and Maps

Figure 1.2 Kariba Dam Location 1:50 000 Scale



Source: Surveyor General, Harare- Kariba 1628 D2
Scale: 1:50 000
Inset: ESRI Data and Maps

Figure 1.3 Layout of the Kariba Dam



Source: Tractebel Engineering, 2014

Water is released from the reservoir through six sluice gates located approximately 80 m above the river level downstream of the dam. In the first 20 years after the dam was constructed there were sustained heavy spillage episodes resulting in erosion of the bedrock to 80 m below the normal water level. This area is known as the 'Plunge Pool' (*Figure 1.3*). If not addressed, the plunge pool will begin to present a significant risk to the stability of the dam wall.

Failure to implement remedial measures to the plunge pool will result in the failure to operate the reservoir as expected (i.e. at a reduced capacity) and an increase in the risk of dam wall failure. A scenario where the dam wall fails will release a flood event of a total 273 km^3 resulting in a major loss of life as the flood plain is home to approximately three million people; loss of livelihoods (socio-economic activities); environmental degradation; and a loss of main source of power to the region. Therefore it is necessary to implement the remedial action to avoid such an event.

Apart from the need to reshape the plunge pool, there is also a need to rehabilitate the six sluice gates that make up the spillway. The work needed within the sluices is associated with the refurbishment of the concrete surface of all sluices, which have been distorted over the years due to an advanced

alkali-silica reaction. Without functional sluices, the reservoir level cannot effectively be maintained to take into account the flood regime of the Zambezi River. Without the ability to release water from the reservoir, there is a danger of the reservoir being too full prior to a flood event, and the subsequent flood event causing over topping of the dam wall which could lead to dam failure.

1.3 PROJECT OBJECTIVES

The Kariba Dam Rehabilitation Works has two main objectives. The first objective is to improve the stability of the plunge pool through reshaping its profile. This will limit the preferential erosion towards the foundations of the dam wall along zones of weak rock and allow for the safe operation of the dam and continued generation of electricity from the hydropower plants. The second objective of the project is to rehabilitate the six sluice gates of the spillway, enabling the ongoing use of the spillway function to safely manage the reservoir levels.

1.4 PROJECT PROPONENT

The Zambezi River Authority (ZRA), a corporation jointly and equally owned by the governments of Zambia and Zimbabwe, is the project proponent for the proposed Kariba Dam Rehabilitation Works.

ZRA was formed by the Zambezi River Authority Act of 1987 (Act No. 17 and 19 Zambia and Zimbabwe respectively) and is governed by a Council of Ministers consisting of four members: two are Ministers in the Government of the Republic of Zambia; and two are Ministers in the Government of Zimbabwe. The Ministers are those holding portfolios of Energy and Finance in the respective countries.

The functions of ZRA are set out in the schedule to the Act, and are as follows [(1)]:

- Operate, monitor and maintain the Kariba Complex ("Kariba Complex means: the Kariba Dam and reservoir, all telemetering stations relating to the Kariba Dam, any other installations owned by the Authority").

- In consultation with the National Electricity Undertakings, investigate the desirability of new dams on the Zambezi River and make recommendations thereon to the Council.

- Subject to the approval of the Council, construct, operate, monitor and maintain any other dams on the Zambezi River.

(1) ZRA, 2014, Functions, http://www.zaraho.org.zm/functions.html

- Collect, accumulate and process hydrological and environmental data of the Zambezi River for the better performance of its functions and for any other purpose beneficial to the Contracting States.

- In consultation with the National Electricity Undertakings, regulate the water level in the Kariba reservoir and in any other reservoir owned by the Authority.

- Make such recommendations to the Council as to ensure the effective and efficient use of the waters and other resources of the Zambezi.

- Liaise with the National Electricity Undertakings in the performance of its functions that may affect the generation and transmission of electricity to the Contracting States.

- Subject to provisions of Article 13 of the Act, recruit, employ and provide for the training of such staff as may be necessary for the performance of its functions under the Agreement.

- Submit development plans and programmes to the Council for approval.

- Give effect to such directions, as may from to time, be given by the Council.

- Carry out such other functions as are provided for the Agreement or are incidental or conducive to the better performance of its functions.

The proponent contact details in the application are:

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1.5 PURPOSE OF THIS REPORT

The Kariba Dam Rehabilitation Works Project is not a scheduled activity under the Zambian and Zimbabwean Environmental Legislation (1); however, the ZRA has committed to comply with international guidelines and standards, and as such is required to undertake a full ESIA for the Project.

(1) Please note that the legislation does list activities associated with the construction of dams; however, not with the rehabilitation/refurbishment of dams.

In addition to international guidelines and standards, the ESIA will conform and meet the environmental regulatory requirements for both Zambia and Zimbabwe. For Zambia this includes the Environmental Management Act (Act 12 of 2011) and the Environmental Impact Assessment Regulations (No. 28 of 1997), and for Zimbabwe this includes the Environmental Management Act (Chapter 20:27), No. 13 of 2002 and the Environmental Management (Environmental Impact Assessment and Ecosystem Protection) Regulations of 2007.

In accordance with the Zambian and Zimbabwean Environmental Management Acts, there is a legal requirement for the Project proponent to respectively submit an Environmental Scoping Report and an Environmental Prospectus report as part of the overall ESIA process. As per the agreed outcomes in a meeting held with the Zambian and Zimbabwean Environmental Management Authorities (dated 24 November 2014, held at the ZRA Administrative Block in Kariba), in which the implementation of a harmonised ESIA process was discussed, a joint Scoping/Prospectus Report (this report) must be submitted to both Environmental Authorities for review. This Scoping/Prospectus Report fulfils the Zambian requirements for a Scoping Report and Zimbabwean requirements for a Prospectus report.

In addition to Zambian and Zimbabwean legal requirements, the ESIA will also need to conform to international standards and best practices, in particular the requirements of the African Development Bank, the World Bank Group, the International Finance Corporation (IFC) and the Equator Principles. The ESIA will also conform with other international guidelines and standards directly applicable to dam-building and hydropower projects such as the World Commission on Dams (WCD), the International Hydropower Association (IHA) guidelines and the Southern African Power Pool (SAPP) environmental and social impact assessment guidelines.

The Scoping/Prospectus Report is the first phase of the overall ESIA process and provides an initial introduction to the Project and its location, and places the Project within the environmental and socio-economic context as well as the legislative framework. The report highlights some of the initial potential environmental and socio-economic issues facing the proposed development and possible mitigation and enhancement measures.

The purpose of the scoping study is to identify the environmental consequences of the Project, and to consider input from stakeholders. The study aims to provide the relevant authorities with enough information to make a decision regarding the Project, or the need for further biophysical or socio-economic studies. The main objectives of the Scoping/Prospectus Report are therefore to:

- Present the ESIA process and the relevant national legislation and international obligations that will be adhered to;
- Present a description and objectives of the Project;

- Present the alternatives assessed and the rationale behind the preferred alternative;
- Present the biophysical and socioeconomic conditions of the Study Area;
- Present the issues raised during the initial public consultation process;
- Identify the environmental and social issues related with this project, on which the ESIA study shall be focused; and
- Present an outline of the terms of reference for the various specialist studies that will address the identified environmental and social issues.

PLEASE NOTE:

The Scoping Report does not present the assessment of the environmental impacts or other definitive answers; these shall be presented in the ESIA Report.

1.6 STRUCTURE OF REPORT

This Scoping / Prospectus Report is structured as follows:

Table 1.1 Scoping Report Structure

Chapter	Contents
Chapter 1 Introduction	Presents a brief background to the Project and Project Proponent. Moreover, Chapter 1 presents the objectives of the Project and associated ESIA process.
Chapter 2 Project Rationale	Provides a description of the motivating factors for the Project.
Chapter 3 Project Description	Includes a detailed description of the proposed activities of the Project.
Chapter 4 Environmental and Social Baseline	Describes the receiving environment (baseline), including biophysical, biological and social aspects.
Chapter 5 Administrative Framework	Overview of applicable legislation, policy and guidelines.
Chapter 6 Public Participation Process	Describes the public participation process activities and key stakeholder feedback to date.
Chapter 7 Identified Potential Impacts	Provides a summary of key issues raised and the potential impacts associated with the proposed activities.
Chapter 8 Alternatives Analysis	Describes the different subprojects alternatives under consideration.
Chapter 9 Proposed ESIA Study Plan	Provides concluding comments about the proposed activity and outlines the terms of reference for specialist studies to address identified key issues.
Chapter 10 Expertise Required for the Project	Details the proposed project team for undertaking the ESIA process.
Chapter 11 Conclusion	Summarises the key findings of the Scoping/Prospectus Report
Chapter 11 References	Provides all references used in the Scoping Report.

In addition, the report includes the following annexes:

- Annex A – Consultation Materials
- Annex B – Project Team CV's