Eskom	Scope Of Work	Hendrina Power Station

Title: **Scope of work for Geotechnical studies and Slope stability assessment**

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1. INTRODUCTION

Hendrina Ash Dam

Hendrina power station is located approximately 40km south of Middelburg at the town of Hendrina in Mpumalanga. At the time it was built it was the largest station to be designed by ESCOM (Electricity Supply Commission), with an ultimate generating capacity of 2 000MW, consisting of ten 200 MW machines.

Hendrina power station has an ash dam that was recently categorized as a dam with a safety risk. According to the National Water Act, Act No 36 of 1998, a dam with a safety risk is any dam which can contain, store or dam more than 50 000 cubic metres of water, whether that water contains any substance or not, and which has a wall of a vertical height of more than five metres and thus with a category change from category 2 to category 3 geotechnical studies and slope stability assessment must be conducted

2. SUPPORTING CLAUSES

2.1 SCOPE.

Geotechnical Studies scope:

- Seismic Cone Penetration tests (SCPTu) with dissipation testing. To be done on 6 sections, with 3 probes per section line for a total of 18 probes.
- SCPTu probes must continue to at least 3m into foundation soils.
- Dissipation tests must be conducted in every probe at 2.0m intervals.
- Seismic cone tests must be conducted in every probe at 2.0m intervals.
- Mostap samples to be taken in the probes.
- Samples of the ash residue to be taken from the surface and via Mostap sampling in the CPTs.
- Samples to be submitted to a SANAS accredited laboratory for the following testing:
  - Particle size distribution to 2µm
  - Atterberg Limits
  - Specific Gravity (SG)
  - Maximum and minimum density (void ratios)
  - Triaxial testing (critical state line)
  - Permeability
  - Soil water characteristic curve
- Submit a detailed geotechnical report.

Stability assessment scope:

- APP application notification

- Desk Study
- Dam Inspection: inspection must also include a drone flight to allow for aerial inspection.
- Compilation of Stability Report
- Submission to the DSO for Approval

2.1.1 Purpose

The purpose of this document is to provide a scope of work for Geotechnical studies and Dam safety evaluations.

2.1.2 Applicability

This document shall apply to Eskom Hendrina Power Station ash dam.

2.2 NORMATIVE/INFORMATIVE REFERENCES

2.2.1 Normative

[1] ISO 9001 Quality Management Systems.

[2] ISO 45001 Occupational Health & Safety Management Systems

[3] ISO 14001 Environmental Management System

[4] SANS 10286 Code of Practice for Mine Residue

2.2.2 Informative

[5] Occupational Health and Safety Act (OHSA) Act 85 of 1993

[6] Eskom Hendrina power station Ash dam operating manual.

[7] National Environmental Management Act, 1998 (Act No.107 of 1998)

[8] South African Council of large dams (SANCOLD) guidelines

[9] National Water Act, 1998 (Act No. 36 of 1998) – More specifically, Chapter 12

2.3 DEFINITIONS

Definition	Description
Occupational Health and Safety	Measures adhering compliance with Occupational Health and Safety Act (Act 85 of 1993) and its regulations and with the Employers Health and Safety Specification
Environmental Management	Measures adhering compliance with Environmental Management Plan
KPI	Measurement of the project deliverables

2.3.1 Disclosure Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 ABBREVIATIONS

Abbreviation	Description
OHSA	Occupational Health & Safety Act
ISO	International Organization for Standardization
KPI	Key Performance Index
N/A	Not Applicable
QIP	Quality Inspection Plan
QCP	Quality Control Plan
SANS	South African National Standards
SHERQ	Safety, Health, Environmental, Risk and Quality
SANAS	South African National Accreditation System

2.5 ROLES AND RESPONSIBILITIES

Civil Engineering – Compile scope of work.

2.6 PROCESS FOR MONITORING

Not applicable

2.7 RELATED/SUPPORTING DOCUMENTS

Not applicable

3. AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation

4. REVISIONS

Date	Rev.	Compiler	Remarks
June 2023	0		Initial Document

5. DEVELOPMENT TEAM

The following people were involved in the development of this document:

6. ACKNOWLEDGEMENTS

N/A

TASK BREAKDOWN

Activity number	Description	Unit	Total
1	Professional fees, Fieldwork, analysis, and reporting	Sum	
2	Field testing		
3	Piezocone (SCPTu) testing*	Sum	
	Core drilling rig on standby	Days	
4	Laboratory testing - ash residue		
	Foundation Indicator & SG	no	4
	Max and min void ratio	no	4
	FH Permeability	no	2
	Triaxial – critical state line	no	2
	Soil water characteristic curve	no	2
	Travelling	km	
	Accommodation for engineer	Night	
5	Handling Fee	sum	

PIEZOCONE (SCPTu) TESTING

Activity number	Description	Unit	Total
1	Professional Fees (contractor data analysis	Sum	1
2	Establishment	sum	1
3	SCPTu testing		
3.1	Setups	no	18
3.2	CPTu testing (assume 50m/test)	m	1005
3.3	Dissipation tests (assume 1 test every 2.0m, 15min per test)	min	7538
3.4	Seismic cone testing (assume 1 test every 2.0m)	no	503
4	MOSTAP sampling		
4.1	Setups	no	8
4.2	Sampling	no	24
5	Health and safety	Sum	1