

	Scope of Work	Hendrina Power Station
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Title: **Ash dam professional services
scope of work.**

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Alternative Reference
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Area of Applicability: **Hendrina Power Station**

Functional Area: **Civil Engineering**

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Content

	Page
1. Introduction	3
2. Supporting Clauses	4
2.1 Scope	4
2.1.1 Purpose	4
2.1.2 Applicability	4
2.2 Normative/Informative References	5
2.2.1 Normative	5
2.2.2 Informative	5
2.3 Definitions	5
2.4 Abbreviations	5
2.5 Roles and Responsibilities	6
2.6 Process for Monitoring	6
2.7 Related/Supporting Documents	6
3. Specification and description of the services	6
3.1 Approved professional person services	6
4. SHEQR requirements	7
5. Records to be kept	7
6. Notes / Forms / Appendices / Annexures	8
7. Acceptance	8
8. Revisions	8
9. Development Team	8
10. Acknowledgements	8

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1. Introduction

The Hendrina Power Station has the following dams:

- Ash Disposal Facility (Ash Dams Nos.1, 2, 3, 4 and 5) (Dam with a safety risk category 3)
- Raw Water Reservoir (Two compartments), (Dam with a safety risk category 2)
- Ash Water Return Dams (AWRDs Nos. 1, 2, 3, 4, 5, 6 and 7)
- Seepage Dam, Seven-year Dam and Maturation Pond
- Waste water recovery dams (Two Compartments)

The ADF at Hendrina PS is situated approximately 3 km to the South of the power station. The ADF complex comprises five compartments with a footprint covering a total area of approximately 305 Ha. The compartments were developed progressively as the operations continued and each compartment started to reach the end of life, with the No. 1, 2 and 3 compartments developed from the inception of the power station. Compartments No.4 and 5 were introduced later during 1998 and remain operational currently. Ashing operations originally started in the North-East corner of the existing Ash Dam 1 and progressed gradually southwards away from the power station as more ash dams were developed. The compartments Nos. 3, 4 and 5 are currently operated as a consolidated compartment of the ADF, hence for easy referencing in this report and for future use the consolidated compartment will be reported as Ash Dam 345. Ash dam compartments 1 and 2 are operated individually as an emergency ash deposition facility.

The Ash Water Return Dams (AWRD) are situated to the East and North-West of the ADF. The AWRDs receive penstock decant water and outflows from the internal drainage system of the ADF that is collected and conveyed via a solution trench (perimeter conveyance channels) located along the toe of the ADF. There are currently operational gravity penstocks located within the No. 3, No. 4, and No. 5 compartments. The penstock in compartments No. 3 and No. 4 comprises the conventional precast concrete rings while the penstock on compartment No. 5 comprises steel rings.

Standpipe piezometers are present at the ADFs and are used to generate an indication of the phreatic levels within the ADF compartments. The piezometers are arranged in straight line clusters, with the alignment leading from the ADF toe directly inwards towards the pool area along identified lines.

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The Seven-Year Dam is located on the Eastern side of the power station and the dam receives and stores contaminated stormwater from the station. On the western side of the station, adjacent to the Wastewater Treatment Plant, there is a Maturation Pond together with wastewater recovery dams that receives and stores industrial effluent, which is later pumped into the Upper Dams.



Figure 1: Ash dam layout

2. Supporting Clauses

2.1 Scope

The document covers the scope of work and minimum requirements for ash dam complex professional services.

2.1.1 Purpose

The purpose of this document is to provide the scope of work for the Ash Dam complex professional services.

2.1.2 Applicability

The document is applicable to Hendrina Power Station Ash Dam complex only.

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2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] National Water Act, 1998 (Act No. 36 of 1998) – More specifically Chapter 12
- [2] South African National Standards: Code of Practice, Mine Residue, SABS 0286: 1998
- [3] National Environmental Management Act, 1998 (Act No.107 of 1998)
- [4] South African Council of Large Dams (SANCOLD) guidelines
- [5] International Council of Large Dams (ICOLD) bulletins and guidelines
- [6] The Australian Council of Large Dams (ANCOLD) guidelines are considered and included where applicable as part of the best practice approach.

2.2.2 Informative

- [7] Ash dam operation and maintenance manual.

2.3 Definitions

Definition	Description
Penstock	Decant tower used to drain water from the ash dams.

2.4 Abbreviations

Abbreviation	Explanation
ADF	Ash Disposal Facility
APP	Approved Professional Person
AWRD	Ash Water Returns Dam
DSO	Dam Safety Office
DWS	Department of Water and Sanitation
ECSA	Engineering council of south Africa
SANS	South African National Standards

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2.5 Roles and Responsibilities

Role	Responsibility
Civil Engineering	Compile the specification required for the inspections
Contract Manager	Facilitates the process of sourcing a consultant to execute the scope of work

2.6 Process for Monitoring

N/A.

2.7 Related/Supporting Documents

Ash Dam Operations and Maintenance Manual.

3. Specification and description of the services

3.1 Approved Professional Person services.

- Take full Professional responsibility of Hendrina Power Station Ash dams 1, 2, 3, 4, 5 as described in the National Water Act and Regulation R139 and SANS 10286-- The South African Code of Practice for Mine Residue and give guidance on the new ash dam designs and report progress to contract manager monthly.
- Take full Professional responsibility for the Ash Water Return Dams 1, 2, 3, 4, 5, 6, 7 as well as the Seepage Dam, Seven Year Dam, Waste Water Recovery Dams and Maturation Pond.
- Chair monthly site meetings and do inspections of the dams before each meeting.
- Prepare monthly inspection reports based on the study of monthly report generated by the Ash dam contractor. Reports to be submitted to the contract manager.
- Advise Employer's personnel monthly on safety and environmental risks and recommend actions.
- Ensure that the ash dam structural safety is not compromised in any way by any action.
- Provide advice on any action deemed necessary to ensure the long-term health of the Ash Dams, Ash Water Return Dams and Water Dams.
- Skills transfer from the APP to the Eskom personnel.

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Services required.

Description of the works	Frequency
Check condition of outer slopes, ash dam toes	Monthly
Check filter drain discharges, piezometer reading	Monthly
Check condition of the penstock	Monthly
Check and Monitor freeboard of 1.5m and extent of the pool 200m from the outer crest of the day wall	Monthly
Raw Water Reservoir (Two compartments), Ash Water Return Dams (AWRDs Nos. 1, 2, 3, 4, 5, 6 and 7), Seepage Dam, Seven-year Dam, Maturation Pond and Waste water recovery dams (Two Compartments)	Monthly
Undertake topographical survey	Every 1 year
Remaining Capacity assessment	Every 1 year
Wall geometry and Freeboard level assessment	Every 1 year
Material testing (geotechnical investigation)	Every 3 years
Undertake a stability check	Every 3 years
Risk assessment	Every 3 year
Dam Safety Evaluation on Ash Disposal Facility.	Every 3 years
Dam Safety Evaluation on Raw Water Dams.	Every 3 years

4. SHEQR requirements

The Contractor complies with the Occupational Health and Safety Act no 85 of 1993 and its regulations, Eskom SHE Policy, Standards, Procedures, Guidelines, Specifications and Regulations.

5. Records to be kept

Inspection reports

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6. Notes / Forms / Appendices / Annexures

None

7. Acceptance

This document has been seen and accepted by:

Name	Designation
	Civil Engineer
	Auxiliary/Civil Engineering Manager acting
	Chief Engineer Prof Civil
	Chief Engineer Prof Civil
	Chief Engineer Prof Civil

8. Revisions

Date	Rev.	Compiler	Remarks
2024-05-07	0		Final document

9. Development Team

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

10. Acknowledgements

- N/A

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