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EAST AFRICAN STANDARD

Development, maintenance and management of groundwater resources — Part 7: The rehabilitation of water boreholes

EAST AFRICAN COMMUNITY

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Introduction

In the preparation of this East African Standard, the following source was consulted extensively:

SANS 10299-7:2003, *Development, maintenance and management of groundwater resources — Part 7: The rehabilitation of water boreholes*

Assistance derived from this source and others inadvertently not mentioned is hereby acknowledged.

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SOUTH AFRICAN NATIONAL STANDARD

Development, maintenance and management of groundwater resources

Part 7: The rehabilitation of water boreholes

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Table of changes

Change No.	Date	Scope

Foreword

This South African standard was approved by National Committee STANSA SC 5120.12B, *Water supply, equipment and systems – Groundwater extraction*, in accordance with procedures of Standards South Africa, in compliance with annex 3 of the WTO/TBT agreement.

Annex A is for information only.

SANS 10299 consists of the following parts, under the general title *Development, maintenance and management of groundwater resources*:

Part 0: *Glossary of terms.*

Part 1: *The location and siting of water boreholes.*

Part 2: *The design, construction and drilling of boreholes.*

Part 4: *Test-pumping of water boreholes.*

Part 5: *The design, selection and performance of pumping equipment for production boreholes.*

Part 6: *The installation and commissioning of pumping equipment for production boreholes.*

Part 7: *The rehabilitation of water boreholes.*

Part 8: *The management of water boreholes.*

Part 9: *The decommissioning of water boreholes.*

Development, maintenance and management of groundwater resources

Part 7: The rehabilitation of water boreholes

1 Scope

This part of SANS 10299 specifies methods to be applied for the rehabilitation of water boreholes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of SANS 10299. All standards are subject to revision and, since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this part of SANS 10299 are encouraged to take steps to ensure the use of the most recent editions of the standards indicated below. Information on currently valid national and international standards can be obtained from Standards South Africa.

SANS 10299-0, *Development, maintenance and management of groundwater resources – Part 0: Glossary of terms.*

SANS 10299-1 (SABS 0299-1), *Development, maintenance and management of groundwater resources – Part 1: The location and siting of water boreholes.*

SANS 10299-5 (SABS 0299-5), *Development, maintenance and management of groundwater resources – Part 5: The design, selection and performance of pumping equipment for production boreholes.*

SANS 10299-8, *Development, maintenance and management of groundwater resources – Part 8: The management of water boreholes.*

3 Definitions

For the purpose of this part of SANS 10299, the definitions given in SANS 10299-0 apply.

4 Assessing the necessity to rehabilitate a water borehole

A borehole should be a candidate for rehabilitation for a variety of reasons including, but not limited to the following:

- a) the specific capacity index, as specified in SANS 10299-8, decreases;
- b) a deterioration in water quality is detected;

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- c) a down-the-hole investigation reveals a build-up of encrustation or bio-fouling;
- d) when sand/silt pumping occurs (e.g. structural deterioration or screen collapse occurs);
- e) when the borehole yield declines;
- f) when corrosion of the casing or screen affects the structural integrity of the borehole; and
- g) when so recommended by a professional person.

5 Methods of rehabilitation of a water borehole

The method employed shall depend on the nature of the aquifer and the original construction of the water borehole, together with the problem being experienced.

Methods shall include combinations of the following:

- a) pump system inspection and maintenance;
- b) mechanical means of agitating the water interception zone of the borehole, for example, bailing, brushing, water/air jetting or surging, etc.;
- c) chemical means of removing encrustation or clogging, for example, washing, use of hyper phosphate, chemical heat treatment, etc.;
- d) use of disinfectants, for example, chlorine compounds;
- e) reconstruction in accordance with SANS 10299-5 of the borehole where the screen is inadequate or has collapsed; and
- f) hydro fracturing.

6 Re-commissioning

6.1.1 After any treatment, the water borehole shall be cleared by pumping, bailing, airlifting, etc., until the water is clear.

6.1.2 The borehole water shall be sampled for water quality testing according to an acceptable set of guidelines recommended for the proposed use of water (refer to annex A).

7 Supervision

In all cases rehabilitation treatment shall be done by a competent person or under the supervision of a professional person (or both).

Annex A
(informative)

Water quality guidelines for the intended use of borehole water

A.1 General

Water quality is evaluated in accordance with accepted sets of guidelines. The guidelines differ from one another depending on the purpose for which the water is or will be used.

A.2 Domestic use

The following guidelines are recommended for evaluating human drinking water quality:

- a) SANS 241, *Drinking water*.
- b) Department of Water Affairs and Forestry: 1996, *South African Water Quality Guidelines* (second edition), Volume 2: *Domestic Use*.
- c) Department of Water Affairs and Forestry, Department of Health and Water Research Commission, 1998: *Quality of Domestic Water Supplies* (second edition) Volume 1: *Assessment Guide*.

A.3 Other use

The following guidelines are recommended for the evaluation of water quality for purposes other than domestic use:

- a) Recreational purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 2: *Recreational Water Use*.
- b) Industrial purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 3: *Industrial Water Use*.
- c) Irrigation purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 5: *Agricultural Water Use: Irrigation*.
- d) Livestock watering purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 5: *Agricultural Water Use: Livestock Watering*.
- e) Aquaculture purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 6: *Agricultural Water Use: Aquaculture*.
- f) Environmental purposes: Department of Water Affairs and Forestry, 1996. *South African Water Quality Guidelines* (second edition). Volume 7: *Aquatic Ecosystems*.

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A.4 Other publications

The following guidelines are recommended for assessing, sampling, analysing, treating and managing the quality of domestic water supplies:

Department of Water Affairs and Forestry: *Quality of domestic water supplies*

1. Volume 2: *Sampling guide*
2. Volume 3: *Analysis guide*
3. Volume 4: *Treatment guide*
4. Volume 5: *Management guide*.

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