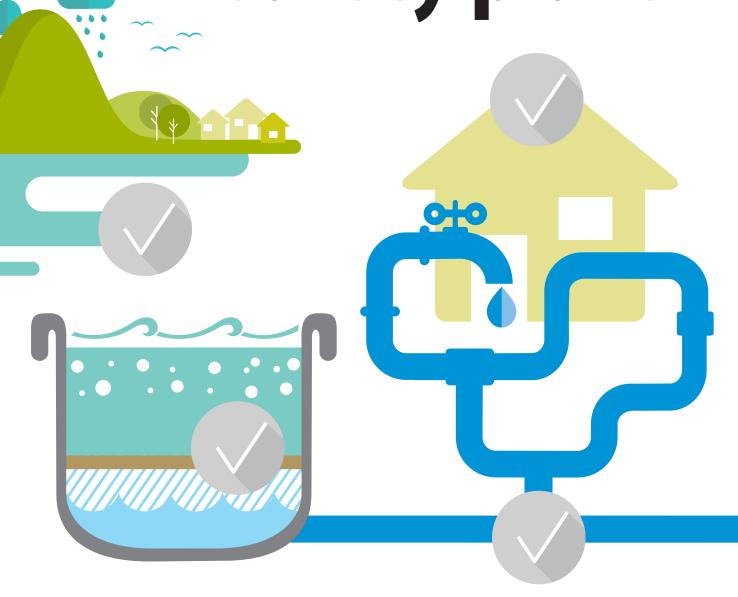
# A practical guide to Auditing water safety plans







# A practical guide to Auditing water safety plans





## WHO Library Cataloguing-in-Publication Data

A practical guide to auditing water safety plans.

1.Water Quality. 2.Drinking Water. 2.Water Pollution. 4.Water Supply. I.World Health Organization. II.The International Water Association. ISBN 978 92 4 150952 7 (NLM classification: WA 675)

# © World Health Organization 2015. Reprinted 2016

All rights reserved. Publications of the World Health Organization are available on the WHO website (www.who.int) or can be purchased from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; email: bookorders@who.int).

Requests for permission to reproduce or translate WHO publications — whether for sale or for non-commercial distribution — should be addressed to WHO Press through the WHO website (www.who.int/about/licensing/copyright\_form/en/index.html).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

# International Water Association (IWA)

The International Water Association (IWA), a global network of water professionals, is a non-governmental organization (NGO) in Official Relations with WHO. WHO's network of NGOs in Official Relations contributes to promote the policies, strategies and programmes derived from the decisions of the Organization's governing bodies. IWA's role as an NGO in Official Relations with WHO focuses on supporting countries to implement intersectoral policies and interventions for protecting health from immediate and longer term environmental threats. A long history of cooperation exits, built on previous joint activities between WHO and IWA's predecessors, the International Water Supply Association and the International Water Quality Association. A key area of cooperation is drinking-water safety.

IWA's Bonn Charter for Safe Drinking Water promotes the application of water safety plans (WSPs) as expressed in the WHO Guidelines for Drinking-water Quality. (Revisions to the WHO Guidelines will be taken as revisions to the Bonn Charter in as much as the Bonn Charter refers to the Guidelines.) IWA promotes WSPs with WHO through collaboration agreements, and through its membership of water utilities, research institutes, industry, and individual professionals. IWA's work spans the continuum between research and practice, covering all facets of the water cycle. IWA is a registered charity in England (Company registered in England No. 3597005 Registered Charity (England) No. 1076690).

Editorial Consultant: Vivien Stone

Design and layout by L'IV Com Sàrl, Villars-sous-Yens, Switzerland.

Printed in Spain.

# Contents

| Acknowledgements                              | V  |
|---|----|
| Abbreviations                                 | vi |
| 1. Introduction                               | 1  |
| I.I Purpose and scope                         | I  |
| 1.2 Target audience                           | 2  |
| 1.3 Special considerations for small supplies | 2  |
| 2. A brief overview of WSPs                   | 3  |
| 3. What is WSP auditing?                      | 5  |
| 4. The aim and role of WSP auditing           | 6  |
| 5. Types of WSP audits                        | 7  |
| 6. Audit timing and frequency                 | 9  |
| 6.1 Initial audit                             | 9  |
| 6.2 Periodic audits                           | 10 |
| 6.3 Notice period for audits                  |    |
| 6.4 Initiating the audit                      | II |
| 7. The auditor                                | 12 |
| 7.1 Auditor qualifications                    | 12 |
| 7.2 Audit teams                               | 13 |
| 7.3 Auditor independence                      | 14 |
| 8. Auditor training and certification         | 15 |
| 8.1 Training                                  | 15 |
| 8.2 Certification                             | 15 |
| 9. What to audit                              | 17 |
| 9.1 Establishing audit criteria               | 17 |
| 9.2 Example audit questions                   | 18 |
| 9.3 Field visits                              | 24 |

| 10. Evaluating audit findings                                | 25 |
|--|----|
| 11. Record keeping and reporting                             | 27 |
| II.I Record keeping  | 27 |
| 11.2 Reporting   | 27 |
| 12. List of considerations for developing an auditing scheme | 30 |
| 13. List of considerations for undertaking an audit          | 32 |
| Appendix A: Case studies                                     | 34 |
| A.I Nepal  | 35 |
| A.2 Portugal   | 38 |
| A.3 Victoria, Australia                                      | 41 |
| A.4 New Zealand  | 43 |
| A.5 Singapore  | 45 |
| A.6 South Africa   | 47 |
| A.7 England and Wales  | 49 |
| Appendix B:Toolbox   | 51 |
| B.I List of threats to water safety                          | 52 |
| B.2 Audit criteria and evaluation guidance                   | 54 |
| B.3 Audit plan   | 75 |
| References   | 77 |
| Further reading  | 77 |

# Acknowledgements

The World Health Organization (WHO) and the International Water Association (IWA) wish to express their appreciation to all those whose efforts made this publication possible. Special thanks are due to the international experts who attended the WHO/IWA water safety plan (WSP) audit meeting, organized in coordination with the Asian Development Bank in Manila, Philippines, 23–24 April 2013. The significant contributions of the following experts are also gratefully acknowledged.

## Lead authors

- · David Drury, Consultant (formerly Drinking Water Inspectorate), United Kingdom
- · Angella Rinehold, World Health Organization Consultant, United States of America

# Contributors of case studies and examples

- Tshering Chhoden, Ministry of Works and Human Settlement, Bhutan
- Dan Deere, Water Futures Pty Ltd, Australia
- · Philip de Souza, Emanti Management, South Africa
- · Tayphasavanh Fengthong, Ministry of Health, Lao People's Democratic Republic
- · Lisa Hamilton, formerly Ministry of Health, New Zealand
- · Darryl Jackson, Consultant, Nepal
- · Pranav Joshi, National Environment Agency, Singapore
- · Pawan Labhasetwar, National Environmental Engineering Research Institute, India
- · Bonifacio Magtibay, World Health Organization, Philippines
- · Annabelle May, Drinking Water Inspectorate, United Kingdom
- · Sudan Raj Panthi, World Health Organization, Nepal
- · Colette Robertson-Kellie, Drinking Water Quality Regulator for Scotland, United Kingdom
- · Rui Sancho, Águas do Algarve, Portugal
- · Oliver Schmoll, World Health Organization Regional Office for Europe, Germany
- David Sheehan, Coliban Water (formerly Department of Health, Victoria), Australia
- Patrick Smeets, KWR Watercycle Research Institute, Netherlands
- Steve Smith, Source-2-Tap, United Kingdom
- · Sumitha Sumanaweera, National Water Supply and Drainage Board, Sri Lanka
- Mariette Swart, Rand Water (formerly Department of Water Affairs), South Africa
- Nghia Ton Tuan, World Health Organization, Viet Nam
- Noupheuak Virabouth, Ministry of Public Works and Transport, Lao People's Democratic Republic
- Sujithra Weragoda, National Water Supply and Drainage Board, Sri Lanka

## **Reviewers**

- Eva Barrenberg, formerly World Health Organization, Switzerland
- Emma Carden, Department of Health & Human Services, Victoria, Australia
- Jennifer De France, World Health Organization, Switzerland
- Bruce Gordon, World Health Organization, Switzerland
- · Han Heijnan, Consultant, Lao People's Democratic Republic
- · Asoka Jayaratne, Yarra Valley Water, Australia
- · Rory Moses McKeown, Consultant, Ireland
- · Camilo Munoz-Trochez, formerly International Water Association, United Kingdom
- · Claire Pollard, Drinking Water Inspectorate, United Kingdom
- Donald Reid, Alberta Environment and Sustainable Resource Development, Canada
- Bettina Rickert, Federal Environment Agency, Germany
- · Scott Rostron, Ministry of Health, New Zealand
- David Sutherland, World Health Organization, Regional Office for South-East Asia, India
- Tom Williams, International Water Association, Netherlands

Angella Rinehold and Jennifer De France (both WHO) coordinated the development of this work. Strategic direction was provided by Robert Bos (IWA, formerly WHO) and Bruce Gordon (WHO).

Financial support from the Australian Department of Foreign Affairs and Trade; the Ministry of Health, Labour and Welfare, Japan; and the United States Environmental Protection Agency is gratefully acknowledged.

# Abbreviations

| AbA  | Águas do Algarve, Portugal                 | NEA  | National Environment Agency (Singapore) |
|------|--|------|---|
| DHHP | Department of Hygiene and Health Promotion | NGO  | non-governmental organization           |
|      | (Lao People's Democratic Republic)         | OFI  | opportunity for improvement             |
| DHUP | Department of Housing and Urban Planning   | DA.C | polyaluminium chlorida                  |

预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5\_27319

