

Australian Standard™

**Guidelines for validation procedures for  
chemical analysis of agricultural and  
contaminated soil**

This Australian Standard was prepared by Committee EV-009, Sampling and Analysis of Soils and Biota. It was approved on behalf of the Council of Standards Australia on 16 September 2003 and published on 14 November 2003.

---

The following are represented on Committee EV-009:

Agriculture Victoria  
Association of Consulting Engineers Australia  
Australian Government Analytical Laboratories  
Australian Institute of Medical Scientists  
Australian Society of Soil Science Incorporated  
CSIRO Land and Water  
Department of Mineral Resources, N.S.W.  
Department of Natural Resources and Mines, Qld  
Environment Protection Authority, Victoria  
Minerals Council of Australia  
National Association of Testing Authorities  
Queensland Health Scientific Services  
Royal Australian Chemical Institute  
University of Sydney

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at [www.standards.com.au](http://www.standards.com.au) and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at [mail@standards.com.au](mailto:mail@standards.com.au), or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

---

*This Standard was issued in draft form for comment as DR 02123.*

Australian Standard™

**Guidelines for validation procedures for  
chemical analysis of agricultural and  
contaminated soil**

First published as AS 4764—2003.

**COPYRIGHT**

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd  
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 5542 9

## PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee EV-009, Sampling and Analysis of Soils and Biota, as part of a series on the identification, analytical methods and investigation procedures for the assessment of soil. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide guidelines for the validation of procedures used in the chemical analysis of soils. This Standard specifies criteria necessary to determine that performance of a procedure is suitable for general application to the analysis of soil. It does not set out criteria for the interpretation of results obtained as regards other characteristics such as their relation to total analyte content, bioavailability, etc.

This Standard provides guidance for method validation to professionals engaged in the analysis of soils. The professionals should consider the relevance of the various components of this Standard to the particular method being evaluated and apply them accordingly. Where specific issues are raised that are beyond the scope of this Standard, then the relevant expertise should be sought and the methodological development conducted as required.

A necessary part of the data acquisition process is the chemical analysis of soils by a procedure that can be demonstrated to work reliably with the matrix under investigation. Because soils are heterogeneous by nature, satisfactory performance of an analytical method should be demonstrated with a wide range of variables, before undertaking analysis of samples from a particular site. It is assumed that executing the provisions of this Standard is entrusted to appropriately qualified and experienced people.

## CONTENTS

	<i>Page</i>
1 SCOPE .....	4
2 REFERENCED DOCUMENTS .....	4
3 DEFINITIONS .....	4
4 GENERAL CONSIDERATIONS .....	5
5 RESPONSIBILITIES .....	6
6 SELECTION OF MATRICES FOR VALIDATION PROCEDURE.....	7
7 EVALUATION OF RESULTS .....	9
8 DISPOSAL OF SAMPLES .....	10
9 TECHNICAL REPORT .....	10

**STANDARDS AUSTRALIA****Australian Standard****Guidelines for validation procedures for chemical analysis of  
agricultural and contaminated soil****1 SCOPE**

This Standard provides guidance for validation of procedures to be used for the chemical analysis of soil. It specifically aims to cover the chemical analysis of undisturbed, urban, agricultural and contaminated soils. The Standard describes the factors that need to be taken into account to establish routine applicability of a method for analysis of soils. This Standard does not establish regulatory limits or provide information regarding the relationship of results to factors such as bioavailability. Demonstration of compliance with this Standard is, however, an essential part of determining fitness for the purpose of the chemical analytical procedures.

**2 REFERENCED DOCUMENTS**

The following documents are referred to in this Standard:

AS

- |        |   |
|--------|---|
| 1726   | Geotechnical site investigations  |
| 2830   | Good laboratory practice  |
| 2830.1 | Part 1: Chemical analysis   |
| 2850   | Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct |
| 3870   | Certified reference materials—General guide to material selection, preparation, testing and certification                           |
| 4479   | Analysis of soils   |
| 4479.1 | Part 1: Pretreatment of potentially contaminated soil samples for heavy metal and metalloid analysis                                |
| 4482   | Guide to the sampling and investigation of potentially contaminated soil  |
| 4482.1 | Part 1: Non-volatile and semi-volatile compounds  |

**3 DEFINITIONS**

For the purpose of this Standard, the following definitions apply.

**3.1 Accuracy**

The closeness of agreement between an observed value or test result and the true value or accepted reference value.

NOTE: The smaller the systematic part of the experimental errors which affect the results, the more accurate is the procedure.

**3.2 Analyte**

A substance whose concentration is sought.

NOTE: A number of analytes may be encountered in the examination of soils. These range from nutrients such as nitrogen and phosphorus to contaminants such as heavy metals and chlorinated dioxins.