



WQPN 78, MAY 2008

The *Australian drinking water guidelines 6, 2004* - an overview

Purpose

When we turn on our household taps we expect safe, clean drinking water. The health of our society depends on having an adequate supply of safe water for drinking, cooking, bathing and laundry use. The condition of the catchment which provides the drinking-water source (the area over which rainwater is caught and drains into surface impoundments or ground water wells) is an important factor influencing the quality of water and determines how much treatment is needed before the water is safe to drink.

The *Australian drinking water guidelines 6, 2004* were produced as part of the *National water quality management strategy* and are an initiative of the Council of Australian Governments. These guidelines aim to provide information on acceptable water quality for human consumption and to offer information on measures to ensure their safety. The National Health and Medical Research Council (NHMRC) in collaboration with the Natural Resource Management Ministerial Council (NRMCC) sponsored preparation of the national guidelines, with the assistance of Australia's leading water quality experts. Since the introduction of the initial national guidelines for drinking-water quality in 1972, they have undergone a number of revisions to reflect both the availability of new scientific information on water quality, changes in the Australian water supply industry and experience gathered from national and international studies.

This note provides a brief background to the national guidelines, an overview of their current status and key elements, and explains how this department as the primary manager of the state's fresh water resources, is involved in implementing the guidelines.

The *Australian drinking water guidelines 6, 2004* (ADWG) contain a wealth of information on the management of drinking water systems, monitoring and information on contaminants that may be present. Although not a mandatory standard, the ADWG provide a framework for identifying acceptable water quality and are intended for use by the Australian community and all agencies with responsibilities associated with the supply of drinking water. The key message of this framework is that in order to effectively manage our water supply system, we need to first understand it.

A consumer's guide to the ADWG, *Water made clear*, has also been produced to provide information to the general community on how everyone can help safeguard our drinking water (see web page <www.nhmrc.gov.au/publications/synopses/_files/eh33.pdf>).

The Department of Water is responsible for managing and protecting the state's water resources. One of the department's key responsibilities is to define then protect catchments that are used as a water source to supply the public with drinking water.

History of drinking water standards in Australia

The ADWG define good drinking-water quality from a human health perspective (i.e. microbiological, physical, chemical and radiological quality) and aesthetics (i.e. colour, taste and odour).

These guidelines are the principal reference on drinking-water quality in Australia and apply to any water intended for drinking regardless of where it came from and where it will be used, but do not cover bottled or packaged water.

Drinking water for the purposes of the ADWG is defined as 'water intended primarily for human consumption, but which has other domestic uses'. It may be consumed directly or indirectly via foods prepared with water, or used for domestic purposes such as bathing and in the laundry.

National drinking water guidelines for Australia were first published in 1972 (entitled *Desirable standards for public water supplies in Australian capital cities*) by the National Health and Medical Research Council to ensure water service providers used appropriate quality benchmarks that reflected our local conditions. These were subsequently updated in 1975 and 1977.

In 1980, a revision of the 1977 *Desirable quality for drinking water* document was updated jointly by the NHMRC and the then Australian Water Resources Council. This was seen as a significant development in water quality management as it was the first time water supply and health authorities produced a single guidance document. The initial document (and 1980, 1987 and 1996 revisions) was based on published criteria and standards from the World Health Organisation.

The Australian Drinking Water Guidelines 2004

The ADWG emphasise the importance of preventative management of drinking water quality and focus on identifying and managing risks in a pro-active way rather than reacting to problems as they arise. They provide a flexible framework to apply a risk management approach to the protection of drinking-water quality in a range of local conditions.

The catchment to consumer approach

With the holistic catchment to consumer approach, the emphasis is on drinking-water being kept safe through a combination of catchment protection and treatment measures, with no single intervention considered sufficient to deliver safe, quality drinking water to consumers. Ideally, in the event that one protection barrier fails, other barriers should be sufficient to compensate. Traditional barriers include:

- protecting the catchments and source water via access and development controls
- holding water in protected reservoirs or storage

- treatment including disinfection
- monitoring the quality of water supplies
- protecting the water distribution system
- maintenance of the water distribution system.

The use of a combination of catchment protection and treatment measures is commonly termed the multiple-barrier approach used to protect drinking-water quality.

The ADWG guiding principles

The ADWG form part of the *National water quality management strategy* which aims to 'achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development'.

The ADWG describe six fundamental principles for ensuring safe drinking water:

1. Disease causing microbes (pathogens) present the greatest risks to consumers of drinking water. Protection of water sources and treatment are of paramount importance and must never be compromised.
2. The drinking-water system must have, and continuously maintain, robust multiple protective barriers appropriate to the level of potential contamination risk facing the raw water supply.
3. Any sudden or extreme change in water quality, flow or environmental condition (e.g. extreme rainfall or flooding) should arouse suspicion that drinking water might become contaminated.
4. System operators should respond quickly and effectively to adverse monitoring signals.
5. System operators must maintain a personal sense of responsibility and dedication to providing consumers with safe water, and should never ignore a consumer complaint about water quality.
6. Ensuring drinking-water safety and quality requires the application of a considered risk management approach.

The ADWG framework

The ADWG 2004 promote a new framework that outlines 12 elements (see [Figure 1](#)) for the delivery of safe drinking water. These 12 elements are considered good practice for system management of drinking water supplies and cover the system as a whole, that is, from the collection of water in the catchment right to the provision of the water at the consumer's tap. The elements are interrelated and each supports the effectiveness of the others and requires a holistic approach. With this in mind, inter-agency involvement is vital to the framework's success.

The framework requires all potential hazards to the water supply from the catchment to the consumer's tap to be looked at systematically. Hazards can be anything from animal waste washed into the source during heavy rainfall events to insufficient disinfectant being added during the treatment process. Once the hazards have been identified an assessment of the risk each hazard poses is required.

Risk assessment is conducted by estimating the likelihood that the event will happen, and what the consequences would be if it did. The final element in the process (the review step) is to ensure that the existing preventative measures are sufficient to control the hazards and to improve or replace such measures where necessary.

Management of drinking water through a comprehensive preventative strategy benefits the water industry by providing a framework that:

- promotes public health by assuring safe drinking water for consumers
- enables in-depth systematic evaluation of drinking water supply systems, the identification of hazards and the assessment of risks
- fosters a holistic approach to, and understanding of, management of drinking-water quality
- emphasises prevention and places drinking-water quality monitoring in an appropriate verification role
- introduces a common and standard approach throughout industry
- provides the opportunity for various agencies and stakeholders to identify their areas of responsibility and become involved
- provides a framework for communication with the public and with employees
- addresses the uncertainties in setting guideline values when insufficient scientific data are available.

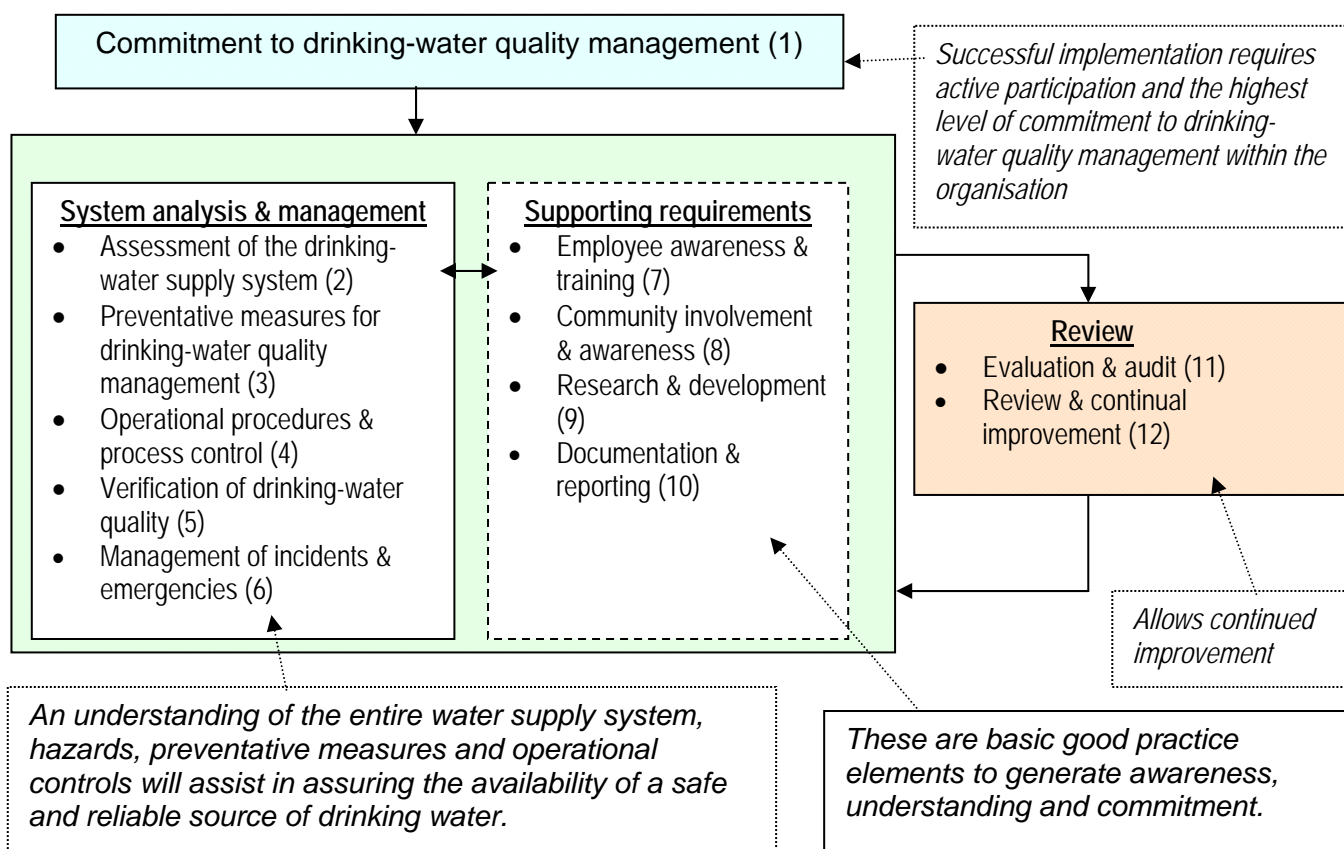


Figure 1. Diagrammatic representation of the 12 elements of the framework for the ADWG 2004.

Implementing the *Australian Drinking Water Guidelines* in Western Australia

The actual application of the ADWG varies between states and territories because of differing arrangements for water supply, e.g. some states' water supplies are managed by a central agency while in others supplies are managed locally by numerous water suppliers. How the framework is applied depends on the needs of the organisation, the separation of responsibilities and the institutional arrangements. Historically the ADWG placed a heavy reliance on treating water to achieve the desired level of safety for supply to the public. It is now recognised that treatment alone does not remove all hazards to human health.

The *State water strategy* (2003) outlines key water issues faced in Western Australia and provides a platform from which solutions can be implemented whilst recognising the state's regional diversity. This strategy outlines the need to closely align land-use and water resource planning to ensure our existing water resources are protected. It states that water source protection plans should be completed for all public drinking-water supply catchments throughout the state.

Ways in which the ADWG and their guiding principles have been adopted in Western Australia include drinking-water catchments being regarded as natural resources *Hope for the future- the Western Australian state sustainability strategy* and the development of actions within this document to ensure the protection of drinking-water sources through active catchment management strategies.

In 2003 the Western Australian Planning Commission produced the *Statement of planning policy: public drinking water source policy*. This policy applies to proclaimed public drinking water source areas (PDWSA) throughout Western Australia. PDWSA are used to supply water to the public for the purposes of drinking and are proclaimed under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*. This policy requires planners to take into account PDWSA protection when making planning decisions on land-use and development within these areas. All land-uses and development should be compatible with the long-term management and protection of public water supply resources.

For further information on PDWSA and land-use compatibility refer to our water quality protection notes *Overview on protecting public drinking water source areas* and *Land use compatibility in public drinking water source areas*. Both of these notes are available at the department's web page at <www.water.wa.gov.au> (select *Water quality* > *Publications* > *Water quality protection notes*).

Drinking-water quality management is a shared responsibility and requires commitment and support from water service providers, local and state government agencies, landowners, developers, industry and the local community.

Table 1 Key stakeholders' responsibilities for delivery of objectives of the ADWG.

Stakeholders	Responsibility in protecting drinking water quality
Department of Agriculture and Food	<ul style="list-style-type: none"> • Ensures sustainable management practice is developed and promoted for agriculture. This includes on-site and off-site impacts of agricultural land use.
Department of Environment and Conservation	<ul style="list-style-type: none"> • Manages land and water entrusted to the department which include national parks, nature reserves, state forests and timber reserves and associated forest produce, flora and fauna. • Implementation of sustainable forest management practices.
Department of Water	<ul style="list-style-type: none"> • Implementation of catchment management aspects of the ADWG framework. • Sustainable management of Western Australia's water resources. • Identifies, assesses, manages, protects, conserves, plans and assigns uses of water resources.
Department of Health	<ul style="list-style-type: none"> • Promotes the effective implementation and operation of the ADWG framework in the catchment. • Regulates the delivery of safe drinking water to consumers via treatment and distribution systems.
Department of Industry and Resources	<ul style="list-style-type: none"> • Regulate and promote environmental management in both the minerals and petroleum industries.
Department of Land Information	<ul style="list-style-type: none"> • Administration of government-controlled land, including unallocated Crown land.
Developers, landowners and the community	<ul style="list-style-type: none"> • Responsible for ensuring their activities and land-use practices do not result in the release of materials which have the potential to contaminate our drinking water sources (for both surface and ground waters).
Local government	<ul style="list-style-type: none"> • Ensures PDWSA are recognised within planning schemes and strategies.
Water service providers	<ul style="list-style-type: none"> • Collect, treat and distribute drinking water to consumers. • Implement the ADWG framework in their areas of control.
Western Australian Planning Commission	<ul style="list-style-type: none"> • Ensures town planning schemes and other strategies take into account the <i>Statement of planning policy: public drinking water source policy</i>.

The role of the Department of Water

The condition of the catchment is one of the most important factors influencing the quality of water. It also determines the form and extent of treatment needed before the water is safe to drink. Water drawn from pristine, natural catchments generally needs less treatment than water that has flowed through agricultural, industrial or urban areas.

Where practical, catchments should be protected by excluding or limiting human activities and land-uses that pose a risk to water quality.

This department has a leading role in defining, proclaiming and protecting catchments which supply drinking water to the public. A key element in the protection of drinking-water sources involves the preparation of drinking water source protection assessments (DWSPA) and plans (DWSPP) for proclaimed PDWSA. Assessments are carried out by this department or its delegate, e.g. a water service provider, that identify activities and environmental factors that have the potential to affect the water quality within a PDWSA.

The preparation of the DWSPP is undertaken in consultation with other government agencies, water service providers, key local stakeholders and the community. The DWSPP conforms to elements 2 and 3 of the ADWG framework. The plan reports on activities and potential risks to water quality within PDWSA and provides appropriate management responses to ensure that the water source remains safe.

As at July 2007, 75 plans had been produced by this department and are available on its website. Landowners, developers, state and local government authorities and the general community should refer to these plans when making decisions or providing advice on land-use and activities within PDWSA. The plans and assessments are available online at <www.water.wa.gov.au> (select *Water quality* > *Publications* > *Plans and assessments*).

This department also has a responsibility for preparing policies and guidelines related to the management and protection of our water resources. For further information is available online at <www.water.wa.gov.au> (select *Water quality* > *Publications*).

More Information

We welcome your views on this note. Feedback provided on this topic is held on our file No. **20374**. This note will be updated periodically as new information is received or protection strategies change. Updates are available online at <www.water.wa.gov.au> (select *Water quality* > *Publications* > *Water quality protection notes*).

To comment on this note or for more information, please contact the Water Source Protection Branch at the department's Atrium offices in Perth, phone 08 6364 7600 (business hours), fax 08 6364 6516 or use *Contact us* on the department's internet site (<www.water.wa.gov.au>), citing the note topic and version.



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Appendices

Appendix A: References and further reading

1. Australian Government - National water quality management strategy
 - *Implementation guidelines* 1998, available at Internet site <www.awa.asn.au> (select *Publications* > *Bookshop* > *Australian guidelines*), request by email from <bookshop@awa.asn.au>, or from a library service.
 - *Australian Drinking Water Guidelines, NHMRC and NRMCC 2004*, available at <www.environment.gov.au/water/publications/quality/index.html>
 - *Water made clear: A consumer guide to accompany the Australian drinking water guidelines 2004*, Australian government, available at <www.nhmrc.gov.au/publications/synopses/_files/eh33.pdf>
2. Government of Western Australia
 - *Hope for the future; the Western Australian state sustainability strategy*, 2003 available online at < www.sustainability.dpc.wa.gov.au/docs/Strategy.htm >
3. Western Australian Planning Commission
 - *Statement of planning policy: Public drinking water source policy*, 2004 available at <www.wapc.wa.gov.au> (select *Publications* > *State planning policies*).
4. Department of Water (WA)
 - *Securing our water future: A state water strategy for Western Australia*, 2003, available at <www.water.wa.gov.au> (select *Planning for the water future* > *state water strategy*)
 - *State water quality management strategy – No1: Framework for implementation*, 2001, available at <www.water.wa.gov.au> (select *Water quality* > *Publications* > *Other publications including maps*)
 - *Water quality protection note: Land use compatibility in public drinking water source areas*, available at <www.water.wa.gov.au> (select *Water quality* > *Publications* > *Water quality protection notes*)