

AUSTRALIAN DRINKING WATER GUIDELINES (2011)  
PROCESS REPORT



# Process report

## 1. Background

The *Australian Drinking Water Guidelines* (ADWG) is an important document that is used widely in Australia and overseas to guide the management of good quality drinking water.

During the development of the ADWG it was recognised that undertaking a major review of the Guidelines in the future would be time consuming and resource intensive. To improve development and ensure the Guidelines continued to represent the latest scientific evidence, the NHMRC initiated an ongoing rolling-revision of the Guidelines. Plans to continue the rolling revision of the ADWG were re-established in late 2006.

## 2. Consultation activities

The following key stakeholders were consulted as part of the process of identifying the priorities for review:

Department of Agriculture, Fisheries and Forestry (DAFF - as secretariat for the NRMCC and therefore involved with the National Water Quality Management Strategy),

Department of Environment, Water, Heritage and the Arts (DEWHA),

Office of Chemical Safety and Environmental Health (OCSEH)

Australian Pesticides and Veterinary Medicines Authority (APVMA),

The Water Working Group of the Environmental Health Committee (enHealth) and

Australian Water Association (AWA).

In conducting the consultation sessions, feedback was sought at the AWA Water & Health Specialty Conference in Sydney in May 2007. Participants included key water quality practitioners in major and larger local council water utilities, representatives of water divisions in health departments or environment units and water quality scientists from catchment boards.

## 3. Establishment of NHMRC Water Quality Advisory Committee

The CEO of the NHMRC established a Water Quality Advisory Committee (WQAC) in 2007 with the following Terms of Reference:

1. Provide rapid scientific and technical advice to the CEO of the NHMRC, on health issues relating to water quality in Australia with a particular focus on:
  - human health implications of the potable use of recycled water (priority task),
  - emerging water related health issues such as water fluoridation and drinking water security, and
  - the need for contribution to community debate on these issues.
2. Identify gaps in knowledge and public policy relating to health issues of water quality and advise on ways of filling those gaps.
3. Identify and advise on key health related research requirements on water quality.
4. Provide advice on the translation of research findings into national health related water quality policy and practice initiatives.
5. Advise on health related ethical issues relating to water quality in Australia, in particular the potable use of recycled water.
6. Advise on how to effectively engage relevant stakeholders.

## 4. Membership of the NHMRC Water Quality Advisory Committee

Prof Don Bursill (Chair)	Adjunct Professor, University of South Australia
Dr David Cunliffe	Environmental Health Service, S A Department of Human Services
Mr Bruce Gray	Water Quality and River Health, Department of Environment, Water Heritage and the Arts
Assoc. Prof. Karin Leder	Infectious Disease Epidemiology Unit, Monash University
Dr Martha Sinclair	Department of Epidemiology and Preventive Medicine, Monash University
Assoc Prof Greg Leslie	School of Chemical Science and Engineering, University of New South Wales
Dr Stuart Khan	UNSW Water Research Centre, University of New South Wales
Mr Chris Davis	University of Technology Sydney; National Water Commission; Urban Water Security Research Alliance, SE Queensland
Ms Jan Bowman	Environmental Health Unit, Public Health Branch, Department of Human Services
Mr Tom Mollenkopf	Chief Executive, Australian Water Association
Mr Adam Lovell	Water Services Association of Australia
Mr Alec Percival	Consumer Representative

### Observers on WQAC

Jenny Paradowski, Director	Environmental Health Section, Health Protection Branch, Office of Health Protection, Department of Health and Ageing.
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## 5. Scope of the review

One of the tasks assigned to WQAC was to oversee the ADWG revision. Recommendations obtained from stakeholder consultation were considered at the inaugural meeting of WQAC in June 2007 and the following revision program was developed:

1. Chapter 6.3.2	Section added in 6.3.2 on Pharmaceuticals and endocrine disrupting chemicals
2. Chapters 9 and 10	Monitoring chapters rewritten
3. Microbial Indicators	Addition of new fact sheets and revision of others
Bacteroides	new
Coliphages	new
<i>Clostridium perfringens</i>	new
<i>Escherichia coli</i>	revised as an indicator and split from thermotolerant coliforms
Heterotrophic plate counts	new
Intestinal enterococci	new
Thermotolerant coliforms	revised and split from <i>E. coli</i>
Total coliforms	revised

4. Bacteria	
<i>Escherichia coli</i> ( <i>E. coli</i> ) (pathogenic)	split from thermotolerant coliforms, revised as a pathogen fact sheet (indicator FS also prepared)
<i>Helicobacter pylori</i>	new
Mycobacterium	revised
5. Protozoa	
Blastocystis	revised
<i>Cryptosporidium</i>	revised
Cyclospora	revised
<i>Giardia</i>	revised
6. Toxic Cyanobacteria	
Cylindrospermopsin	revised
Microcystins	revised
Nodularin	revised
Saxitoxins	revised
7. Viruses	
Adenovirus	revised
Enterovirus	revised
Hepatitis viruses	revised
Norwalk virus	revised
Rotavirus	revised
8. Physical & Chemical	
2,2-DPA	new
2,4-D [(2,4-Dichlorophenoxy) acetic acid]	revised
Acephate	revised
Aldicarb	revised
Aldrin & Dieldrin	revised
Ametryn	new
Amitraz	new
Amitrole	new
Arsenic	revised
Asulam	revised
Atrazine	revised
Azinphos-methyl	new
Barium	revised
Benomyl	revised
Bentazone	new
Beryllium	revised
Bioresmethrin	new
	revised

Bromacil	new
Bromoxynil	new
Captan	new
Carbaryl	revised
Carbendazim / Thiophanate-methyl	new
Carbofuran	new
Carboxin	new
Carfentrazone ethyl	new
Chlorantraniliprole	new
Chlordane	revised
Chlorfenvinphos	new
Chlorine	revised
Chlorine dioxide, chlorate, chlorite	revised
Cloropicrin	revised
Chlorothalonil	new
Chlorpyrifos	new
Chlorsulfuron	new
Clopyralid	new
Cyfluthrin, Beta-cyfluthrin	new
Cypermethrin isomers	new
Cyprodinil	new
DDT	revised
Deltamethrin	new
Diazinon	new
Dicamba	new
Dichloroprop / Dichlorprop-P	new
1-3 Dichloropropene	new
Dichlorvos	new
Diclofop-methyl	new
Dicofol	new
Diflubenzuron	new
Dimethoate	new
Diquat	new
Disulfoton	new
Diuron	new
Endosulfan	new
Endothal	new
EPTC	new
Esfenvalerate	new
Ethion	new

Ethoprophos	new
Etridiazole	new
Fenamiphos	new
Fenarimol	new
Fenchlorphos	new
Fenitrothion	new
Fenthion	new
Fenvalerate	new
Fipronil	new
Flamprop-methyl	new
Fluometuron	new
Fluproponate	new
Glyphosate	new
Haloacetoneitriles	revised
Haloxfop	new
Hexazinone	new
Imazapyr	new
Iodine, iodide	revised
Iprodione	new
Lanthanum	revised
Lindane	new
Maldison (Malathion)	new
Manganese	revised
Mancozeb	new
MCPA	new
Metaldehyde	revised
Metham	new
Methylbromide	new
Methidathion	new
Methiocarb	new
Methomyl	new
Metiram	new
Metolachlor/s–Metolachlor	new
Metribuzin	new
Metsulfuron-methyl	new
Mevinphos	new
Molinate	new
Monochloramine	revised
Naphthalophos	new
Napropamide	new

Nicarbazin	new
Nitrate and nitrite	revised
N-Nitrosodimethylamine (NDMA)	new
Norflurazon	new
Omethoate	new
Oryzalin	new
Oxamyl	new
Paraquat	new
Parathion	new
Parathion-methyl	new
Pebulate	new
Pendimethalin	new
Pentachlorophenol	new
Permethrin	new
Picloram	new
Piperonyl butoxide	new
Pirimicarb	new
Pirimiphos methyl	new
Polihexanide	new
Polycyclic aromatic hydrocarbons (PAHs)	revised
Profenofos	revised
Promecarb	new
Propachlor	revised
Propanil	new
Propargite	new
Propazine	new
Propiconazole	new
Propyzamide	new
Pyrasulfatole	new
Pyrazophos	new
Pyroxsulam	new
Quintozene	new
Silica	revised
Simazine	new
Spirotetramat	new
Sulprofos	new
Taste and odour	revised
Temephos	new
Terbacil	new
Terbufos	new

Terbutylazine	new
Terbutryn	new
Thiobencarb	new
Thiometon	new
Thiram	new
Tin	revised
Toltrazuril	new
Total dissolved solids	revised
Triadimefon	new
Trichlorfon	new
Triclopyr	new
Trifluralin	new
Turbidity	revised
Uranium	revised
Vernolate	new

## 6. Formation of the Australian Drinking Water Guidelines Reference Group

Due to the breadth of the revision it was decided to form five subgroups, with team leaders appointed from within WQAC. The subgroups collectively formed the *Australian Drinking Water Guidelines Reference Group* (ADWGR) and comprised the following eminent Australian experts in the respective fields. NHMRC is grateful to the following people for the excellent work they do on its behalf. The work is usually performed on an honorary basis and in addition to their usual work commitments, and has been crucial in the continued development of the ADWG:

### *Microbiology Reference Group*

Dr David Cunliffe (Chair)	Environmental Health Service, S A Department of Human Services
Dr Martha Sinclair	Department of Epidemiology and Preventive Medicine, Monash University
Dr Karin Leder	Infectious Disease Epidemiology Unit, Monash University
Affiliate Assoc Prof Mike Burch	School of Earth and Environmental Sciences, The University of Adelaide
Dr Melita Stevens	Melbourne Water
Dr Daniel Deere	Water Futures

### *Disinfection Byproducts Reference Group*

Dr Martha Sinclair (Chair)	Department of Epidemiology and Preventive Medicine, Monash University
Dr Paul Byleveld	Senior Policy Advisor, NSW Health
Dr Andrew Humpage	Research Officer, Australian Water Quality Centre
Mr Robert McKenzie	Environmental Health Scientist, Environmental Health Unit, Public Health Branch, Department of Human Services, Victoria



***Physical/Chemical Treatment Quality (Inorganics) Reference Group***

Mr Adam Lovell (Chair)	Water Services Association of Australia
Mr Chris Davis	University of Technology Sydney; National Water Commission; Urban Water Security Research Alliance, SE Queensland
Ms Mary Drikas	Principal Scientist, Australian Water Quality Centre, South Australia
Mr Richard Walker	Executive of the Water Corporation Western Australia
Mr Keith Craig	Technical Director Veolia Water Australia

***Organics Reference Group***

Dr Stuart Khan (Chair)	UNSW Water Research Centre, University of New South Wales
A/Professor Glen Shaw	Senior Lecturer, <i>School of Public Health, Griffith University</i>
Dr Jim Fitzgerald	Principal Toxicologist & Manager, Hazardous Substances Section, Environmental Health Service, Dept of Health Adelaide
A/Professor Heather Chapman	Smart Water Research Facility, Griffith University Gold Coast Campus
Dr Frederic Leusch	Smart Water Research Facility, Griffith University Gold Coast Campus
Dr Melissa Bromley	Department of Water, Western Australia
Dr Heather Coleman	UNSW Water Research Centre, University of New South Wales
Dr Robert Considine	Team Leader, Drinking Water Quality Planning, Asset Planning Division, Melbourne Water
Dr Clemencia Rodriguez	Department of Health, Western Australia

***Monitoring Chapters Reference Group***

Ms Jan Bowman (Chair)	Environmental Health Unit, Public Health Branch, Department of Human Services
Mr David Sheehan	Program Manager - Drinking Water Regulation, Department of Human Services
Mr Bruce Gray	Water Quality Section, Australian Government Department of the Environment, Water, Heritage, and the Arts
Ms Amy Dysart	Water Quality Specialist, Power Water Corporation, Northern Territory
Dr John Howard	Head of Water, Quality and Environment, South Australian Water Corporation
Dr Jeremy Lucas	Water Quality Performance Manager, South Australia Water Corporation
Mr. Richard Walker	Manager, Drinking Water Quality Branch, Water Corporation of Western Australia
Dr. Samantha Rizak	Water Safety Planning Analyst, Drinking Water Quality Branch, Water Corporation of Western Australia



**Table 1** List of submitters to the public consultation

<b>Sub. No</b>	<b>Submitter</b>
1	Central Highlands Water (Vic); Jeff Haydon, General Manager, Water and Wastewater Operations
2	City West Water (Vic); Georges Ruta, Manager, Water Quality
3	Darryl O'Brien
4	Department of Environment, Heritage, Water and the Arts; Kieran Vaughan, Policy Officer, Water Quality Section, Water Group
5	Diana Buckland (Qld)
6	Ecowise Environmental; R. Bannister, J Hearn, A Schmidt (see also #25 for a later sub from Ecowise)
7	Gosford City Council (NSW); Elizabeth Knight, Acting Manager Regulatory Services, Water and Sewerage
8	Goulburn Valley Water (Vic); Brady Schmidt, Senior Treatment Strategist
9	David Wheelright, Hillview Consulting, for & on behalf of FMC Australasia (Qld)
10	Melbourne Water; Melita Stevens, Research Programs Manager; Nicholas Crosbie
11	Natural Health Society of Australia; Roger French, Dip Nutr, M Eng Sci; Health Director,
12	North East Water (Vic); Tamsin Smith, Water Resources Manager
13	National Water Commission; Will Fargher, Acting General Manager, Water Markets and Efficiency Group
14	South East Water (Vic); Kevin Hutchings, General Manager, 'us' Utility Services; contact, Anthea McManemin
15	Werner & Karola Schmidlin (Qld)
16	Yarra Valley Water (Vic); Rod McCoy, Acting General Manager, Infrastructure Services; contact Asoka Jayaratne
17	Anthony Amis, Friends of the Earth Melbourne
18	Department of Health (Vic); Rodney Dedman, Manager, Water Policy, Health Protection Branch
19	Wyong Shire Council (NSW); Ian Johnson, Technical Services Engineer, Water and Sewerage
20	Steve Hrudey, Emeritus Professor, Analytical & Environmental Toxicology Division, Dept of Laboratory Medicine & Pathology, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Alberta, Canada
21	Dr Jim Fitzgerald, Principal Toxicologist & Manager, Public Health Toxicology, Scientific Services – Public Health, Dept of Health, SA
22	Western Water (Vic); John Wilkinson, Managing Director
23	Dr Alison Beaney OBE, MB ChB FACRRM; Break o' Day Catchment Risk Group (Tas)
24	Dr Jim Fitzgerald, Principal Toxicologist & Manager, Public Health Toxicology, Scientific Services – Public Health, Dept of Health, SA
25	ALS Laboratory Group (incorporating Ecowise Environmental since Dec 09); Dean Comris, Managing Director; comments by John Hearh, Adrian Schmidt, Christoel Ferguson, Geoff Anderson, Ross Bannister (see also Sub #6)
26	Water Services Association; Ross Young, Executive Director
27	MQC Management (Vic); HV Nguyen, BE PhD FICHe, Managing Director
28	Water Treatment Alliance and SA Water; Peter Mosse & John Howard, on behalf of the attendees at a Protozoan Risk Management Workshop, Adelaide, 10/11/09.
29	Dept of Health and Human Services (Tas); Dr Roscoe Taylor, Director of Public Health; contact Raquel Esteban, State Water Officer
30	Coliban Water (Vic); Dr Dharma Dharmabalan, General Manager, Planning and Infrastructure
31	ActewAGL (ACT); Duncan Middleton, Water Quality Engineer
32	Water Quality Research Australia (WQRA); Jodieann Daw, CEO

<b>Sub. No</b>	<b>Submitter</b>
33	South East Queensland Water Grid Manager – collated review from the Water Grid entities and 10 Councils connected to the Grid
34	Paul Kamlade
35	Department of the Environment, Water, Heritage and the Arts; Tony Slatyer, First Assistant Secretary, Water Reform Division; contact, Mark Lettfull, Water Quality Section
36	United Water (SA); Jenny Jelbart, Technical Manager
37	Wannon Water (Vic); Mark McNeil, Branch Manager, Treatment Services; Catherine Huf, Environmental Scientist – Treatment Response
38	Dr Philip Orr (Qld)
39	SA Water; Dr John Howard, Health of Water, Quality and Environment, SA Water Corporation
40	Power and Water Corporation (PowerWater) (NT); Andrew Macrides, Managing Director
41	Gold Coast Water; Kelly O'Halloran, Process Assessment & Research; Dr Shannon McBride, Product Quality
42	Fitzroy River Water (Qld); Jason Plumb, BSc PhD, Manager, Process Operations
43	GHD Pty Ltd; Michael Chapman, Dr Ryan Signor, Prof Nicholas Ashbolt, Dr Peter Nadebaum
44	Queensland Govt; Office of the Water Supply Regulator, Department of Environment and Resource Management; AND Water Quality Unit, Environmental Health Branch, Population Health Queensland; contacts Heather Uwins (OWSR), Dr Greg Jackson (WQU)
45	Water Research Centre, University of NSW; David Roser
46	Dr Samantha Rizak (WA)
47	Coffs Harbour Water (NSW); Simon Thorn, Executive Manager Operations
48	Australian Pesticides and Veterinary Medicines Authority
49	National Measurement Institute
50	Dr RS Rosich
51	Port Macquarie – Hastings Council (NSW) Environmental Laboratory; Dr Maree Smith, Laboratory Manager
52	Dr David de Vries (Alice Springs)
53	Warren Godson (WA)
54	NSW Government
55	Water Corporation (Lederville, WA); letter from Keith Cadee, General Manager, Water Technologies Division; comments in ADWG from Samantha Rizak