



CONTAMINATED SITES REPORTING GUIDELINE FOR CHEMICALS IN GROUNDWATER

Scope

This guideline applies to the public health reporting and evaluation for management of chemicals in the groundwater of sites suspected or known to be contaminated. It should be used in accordance with the *Contaminated Sites Act 2003* and the Contaminated Sites Management Series (CSMS)(1) of the Department of Environment and Conservation.

Where groundwater is used as a source of potable water, the National Health and Medical Research Council *Australian Drinking Water Guidelines* (ADWG)(2), will apply.

Rationale

Chemicals are used for a great range of important commercial and public reasons and may inadvertently contaminate soil and groundwater. Health investigation levels already exist for contaminated soil in the CSMS but not for the groundwater. Managing groundwater chemical contamination is important in Western Australia because of the water's use for a variety of purposes.

This guideline is primarily intended to help protect the health of the public who may have cause to use or may be exposed to groundwater that contains chemical residues. Where necessary it also attempts to ensure the aesthetic acceptability of the water, such as odour. The guideline undertakes both of these by establishing appropriate threshold levels. Robust safety margins are built into the threshold levels used. In accordance with Department of Health policy and advice to the public, ground and bore water should not be used for drinking or swimming unless tested and treated (3). Likely reasonable uses for non-treated subsurface water are for irrigation of gardens, including the growing of vegetables, flushing toilets and washing vehicles.

Guideline

General Requirement

The general level of a chemical in groundwater above which requires reporting and evaluation for management is a factor of ten times the corresponding Health value, or Aesthetic value in its absence, in the ADWG, except in specific cases described below.

This general approach is consistent with that used by the World Health Organisation (4) and relevant Australian agencies (5) in making use of drinking water guidelines in regard to standards for recreational-type water use. Although this guideline also allows for possible non-recreational use of groundwater, for instance irrigation, the safety margins used are sufficient to accommodate this.

Case Specific Requirements

Those instances where the General Requirement does not apply are those where the contaminants have particular features or needs, and usually require direct adherence to the ADWG, which should also act as the default standard for uncertain situations.



Pesticides - Pesticides should not normally appear in groundwater if used correctly according to label directions. Detection of pesticides in groundwater can be due to: inappropriate use, illegal disposal or dumping, or environmentally persistent organochlorine compounds. To facilitate the reporting of such contamination, the limits that will apply in this guideline are the Guideline values of the specific pesticides, or in their absence the Health values, as given in the ADWG. The only exceptions are the persistent organochlorine compounds (aldrin, chlordane, DDT, dieldrin, heptachlor and lindane), the use of which are no longer permitted. These organochlorines only will need to be reported if found at above ten times their corresponding Health values in the ADWG.

Odoriferous Chemicals - Some chemicals may have an objectionable odour above certain concentrations in water. The odour may affect the use of the groundwater by some individuals and hence the Aesthetic limit as listed in the ADWG will apply *per se* for those chemicals. The specific chemicals are: chlorobenzene; 1,2-diclorobenzene; 1,3-diclorobenzene; 1,4-diclorobenzene; ethylbenzene; hydrogen sulphide; styrene; toluene; 1,2,3 trichlorobenzene; 1,2,4 trichlorobenzene; 1,3,5 trichlorobenzene; and xylene. In addition, an odour-based threshold of 0.02 mg/L will apply to methyl tertiary butyl ether (MTBE), which is not currently listed in the ADWG.

Summary of Reporting Thresholds for Groundwater Chemical Residues

Generally the threshold is ten times the Health value, or Aesthetic value by default, in the National Health and Medical Research Council Australian Drinking Water Guidelines (2004)(ADWG).

For a pesticide the threshold is the corresponding ADWG Guideline value, or the Health value by default, except for the organochlorine pesticides aldrin, chlordane, DDT, dieldrin, heptachlor and lindane where ten times the ADWG Health value will apply.

For the following pungent chemicals the threshold will be the relevant ADWG Aesthetic value: chlorobenzene; 1,2-diclorobenzene; 1,3-diclorobenzene; 1,4-diclorobenzene; ethylbenzene; hydrogen sulphide; styrene; toluene; 1,2,3 trichlorobenzene; 1,2,4 trichlorobenzene; 1,3,5 trichlorobenzene; and xylene. Also, an odour-based threshold of 0.02 mg/L will apply to methyl tertiary butyl ether.

Where groundwater is used as a source of potable water, the ADWG will apply.

References

1. Department of Environment and Conservation *Contaminated Sites Management Series* (2001-6) - http://portal.environment.wa.gov.au/portal/page?_pageid=53,733059&_dad=portal&_schema=PO RTAL
2. National Health and Medical Research Council and Natural Resource Management Ministerial Council *Australian Drinking Water Guidelines* (2004), or latest edition - <http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm>
3. Department of Health *Using Bore Water Safely* (2004) - http://www.public.health.wa.gov.au/3/658/2/bore_water.pm
4. World Health Organisation *Guidelines for Safe Recreational Water Environments -Volume 1, Coastal and Freshwaters* (2003) - http://www.who.int/water_sanitation_health/bathing/srwe1/en/
5. National Health and Medical Research Council and Natural Resource Management Ministerial Council *Guidelines for Managing Risks in Recreational Water* (2005) - <http://www.nhmrc.gov.au/publications/synopses/eh38.htm>

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