Government of Western Australia
Department of Water

**Water quality protection note 121**
**November 2012**

*Looking after all our water needs*

# Plantations in public drinking water source areas

## Purpose

This note is intended to inform industry operators, government officers, environmental consultants and community members on water quality protection aspects of tree plantations in public drinking water source areas (PDWSAs), including the planning and initial design stages, operation and management, harvesting and re-establishment in subsequent rotations.

This note provides advice on environmental issues and makes recommendations on best practice. Its purpose is to provide guidance on plantation activities within PDWSAs to limit water contamination risk and ensure the protection of water resource quality.

## Overview

Plantations that are well-planned and properly managed have the ability to generate economic, environmental and social benefits. Some of the environmental benefits of establishing appropriate tree plantations in catchment areas include reducing salinity, preventing nutrient and pesticide leaching and maintaining land slope stability.

Poorly managed plantations can lead to degraded water quality through:

- soil erosion from surface water run-off due to slope instability resulting in increased turbidity in surface water bodies
- nutrient and chemical contamination from fertiliser, pesticide and hydrocarbon residues
- pathogens from human activity near waterways.

Water quality (physical, chemical and biological) in PDWSAs should be protected by appropriate management activities that control the change in risk to water quality resulting from plantation activities.

Appendices provide additional background and technical advice as follows:

A. Information on public drinking water sources, note limitations and updates.
B. Relevant statutes and administering agencies.
C. Data needed for assessing developments, followed by references and further reading, note disclaimer and how to provide feedback.

## Scope

This note applies to tree plantations that provide forestry products within PDWSAs. This includes softwoods such as *Pinus radiata* and *Pinus pinaster* and non-indigenous hardwood trees such as *Eucalyptus saligna* (Sydney blue gums) and *Eucalyptus globulus* (Tasmanian blue gums).

The note does not apply to plantation areas located outside of PDWSAs, or plantations for non-wood products such as orchards. Additionally, agroforestry on freehold rural land is not covered by this document, but it may offer some useful guidance on potential risks to water resources and good practice. Water allocation for plantation establishment is also not detailed in this note. Relevant information can be obtained from our regional offices.

- There are several national and state guidelines that underpin advice given in this note. Please see reference numbers 1f, 2, 3, 8 (section 4.4) and 9, displayed in the *References and further reading* section.

## Advice and recommendations

### Acceptability within public drinking water source areas

1 Plantations used for timber products are compatible with conditions in all priority areas within PDWSA. This means the land use is likely to be accepted by the Department of Water provided best environmental management practices are effectively applied.

2 Plantations are considered compatible with conditions (subject to recommendation 17) within reservoir protection zones and wellhead protection zones. Specific conditions covering access and the storage and use of hydrocarbons and chemicals may be applied within these zones.

3 Drinking water source protection reports (DWSPRs) are developed for each PDWSA in Western Australia. They include site-specific recommendations for best practice management to protect water quality. These should be considered by the plantation manager prior to developing a plantation management plan.

### Planning and approvals

*Planning*

4 The location, design and timing of plantations should maintain water quality protection values, including those for drinking water.

5 For an allocation of water to meet the plantation's needs, you need to apply to the Department of Water for a licence. The department has published *Plantation forestry and water management guideline,* which clarifies our role in plantation water use and allocation planning (reference 5b).

6 A plantation management plan (as described in the *Code of practice for timber plantations in Western Australia* (reference 8)) should be developed in consultation with the Department of Water.

7 For guidance on key components of a plantation management plan to facilitate assessment by the Department of Water, see *Appendix C*,*Table 1*. The plantation management plan should include:

   a a plantation map, including location of waterways, foreshore areas, vegetation buffer areas (see relevant recommendations later in this note), native vegetation and other significant features

   b an establishment plan which outlines significant environmental management topics and methods

   c a maintenance plan which prescribes management activities during the rotation of the plantation

   d a fire control plan which contains communication details, firebreaks and water points.

8 For plantations less than 10 ha in area, a harvest management plan should be developed in consultation with the Department of Water. For information that should be included in a harvest management plan for assessment by the Department of Water, see *Appendix C*, *Table 2*.

9 For plantations greater than 10 ha in size, a more detailed drinking water quality management plan (DWQMP) for plantation harvesting should be developed in consultation with the plantation manager, water service provider and the Department of Water. For information that should be included in a DWQMP for assessment by the Department of Water, see *Appendix C*, *Table 2*.

*Approvals*

10 For freehold land and reserves vested in a local government, proponents should submit all plans to the local government, as per the relevant local planning policy. If the plantation is within a PDWSA, the local government should then refer the proposal to the Department of Water for assessment (see *Appendix C*, tables 1 and 2).

11 The clearing of native vegetation in Western Australia is primarily authorised by the granting of a permit under the *Environmental Protection Act 1986* administered by the Department of Environment and Conservation.

12 If the plantation is within a 'clearing control catchment' (see *Appendix A*), a licence to clear vegetation issued by the Department of Water under the *Country Areas Water Supply Act 1947* is also required where:

   a clearing is exempt under the *Environmental Protection Act 1986* (unless there is an exemption granted under the *Country Areas Water Supply Act 1947*)

   b clearing is exempt under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004

   c compensation for refusal of a licence under the *Country Areas Water Supply Act 1947* to a previous client has occurred.

13 When proposing changes to a plantation management plan that could affect water quality in a PDWSA, plantation managers should seek advice from the Department of Water prior to implementing the changes.

14 Harvesting contractors are required to comply with the Forest Industries Federation's *Road haulage code of conduct* (reference 8b).

15 Storage and handling of hydrocarbons and chemicals must comply with relevant constraints (including setbacks from water bodies) described in the *Metropolitan Water Supply, Sewerage and Drainage Act 1909,* the *Country Areas Water Supply Act 1947* and the associated by-laws (see Appendix B).

16 Plantation proposals should also conform to other relevant statutory requirements (see *Appendix B*) prior to their implementation.

17 When entering a designated disease risk area (DRA), all forestry personnel, vehicles and machinery must carry a current Department of Environment and Conservation DRA entry permit, and present it to authorised officers upon request.

## Design and construction

18 Plantations should not be established or replanted on land slopes with a gradient exceeding 1 in 3. Within reservoir protection zones, plantations should not be established or replanted on slopes exceeding 1 in 7, unless structural drainage controls are used to ensure an acceptable risk to water quality.

19 Surface water management—including drainage controls for roads, access tracks and log handling areas—should be undertaken to improve safety, prevent erosion and turbidity and extend the overall working life of infrastructure associated with the plantation. The following documents should be used when considering surface water management controls:

   a Department of Environment and Conservation's Sustainable forest management series *Soil and water conservation guideline*, section 4 and schedules 19–22 (reference 2)

   b Forest Industries Federation (WA) *Code of practice for timber plantations in Western Australia*, section 4.5 (reference 8).

### *Near waterways*

20 An adequate setback distance should be maintained between plantations and waterways (including foreshore areas) to protect their ecological and social values and prevent degradation to water quality. Buffer (setback) distances to PDWSA reservoirs and waterways should be determined by using our Water quality protection note (WQPN) no. 6: *Vegetated buffers to sensitive water resources* (reference 5c).

21 Natural foreshore setback areas are determined on the basis of the waterway values, vulnerability to threats and biophysical criteria as described in our Operational policy: *Identifying and establishing waterway foreshore areas*. Our Water note no. 23 and River restoration report no. 16 both titled: *Determining foreshore reserves,* provide supporting information on identifying foreshore areas (references 5a, 5e and 14b).

22 Natural vegetation buffers can improve water quality by filtering potentially contaminated water before it enters a water body. Local hydrology, types of contaminants, landform and buffer vegetation density are important factors when determining appropriate separation distances between plantations and waterways.

23 Vegetation buffers should be maintained or re-established along waterways and protection zones using native vegetation of local provenance as described in WQPN no. 6.

24 Removal of wildlings (exotic species spread from neighbouring plantation areas) from outside the plantation boundary—including within buffer areas and riparian zones)—should be included as part of the plantation management plan.

25 Plantations must be designed in accordance with the bushfire control legislation (see *Appendix B*).

### Operation and management

26 Operation and management of plantations in PDWSAs should be conducted using the guidance documents shown in references 2 (table 17), 5d, 8 and 9.

27 Operators and subcontractors should adhere to the plantation management plan, harvesting management plan and drinking water quality management plan during plantation establishment, management, and harvesting.

28 Pesticide use in PDWSAs should adhere to:

- a Department of Water's Statewide policy no. 2: *Pesticide use in public drinking water source areas* (reference 5a)
- b Department of Health's Public service circular no. 88: *Use of herbicides in water catchment areas* (reference 3)
- c Department of Health's: A guide to the use of pesticides in Western Australia (reference 3).

29 Consider the following when developing fertiliser prescriptions as part of establishment and maintenance plans:

- a Match fertiliser application to meet the stages of vegetation growth to avoid nitrogen and phosphorus leaching and run-off into waterways.
- b Different soil types have different capacities for nutrient attenuation.
- c Nutrient and irrigation management plans are useful tools to help determine fertiliser requirements (see reference 5c).
- d Fertiliser should be applied under ideal weather conditions to prevent run-off.
- e The 'trafficability index' should be used as an indicative measure for the capacity of soil to cope with traffic from heavy vehicles (see reference 2, schedules 1–3.).

30 Within PDWSAs, any chemical spills or other incidents posing a risk to water quality should be immediately reported to the water service provider. The water Corporation's all-hours phone numbers are 1800 626 636 or 13 13 75.

## Appendix A: Information on public drinking water source areas, note limitations and updates

### Sensitive water resources

Water resources sustain ecosystems, aquatic recreation and aesthetic values and provide drinking, industry and irrigation supplies. Along with breathable air, uncontaminated water

is essential for viable communities. Natural waters must remain within defined quality limits to retain their ecological, social and economic values. To sustain these values these waters require appropriate protection measures to minimise contamination.

Information on water quality parameters and processes to maintain water values are published in the Australian government's National water quality management strategy papers. These papers are available online at <www.environment.gov.au> select *water > water policy and programs > water quality >.*

The Department of Water strives to improve community awareness of drinking water source catchment protection measures (for both surface water and groundwater), as part of a multi-barrier protection approach to sustain acceptable water resource quality. Human activity and many land uses pose a risk to water quality if contaminants are washed or leached into sensitive water bodies in significant quantities.

## Public drinking water source

*Overview*

Public drinking water source area (PDWSA) is the collective name given to any area proclaimed to manage and protect a community drinking water scheme source. PDWSA include *underground water pollution control areas, water reserves* and *catchment areas* administered under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*. For online information on the location of PDWSA, see <www.water.wa.gov.au> select *tools and data > maps and atlases > geographic data atlas,* then open *environment > public drinking water source areas*.

Three priority areas—priority 1 (P1), priority 2 (P2) and priority 3 (P3)—have been defined to guide land planning, rezoning and development approval processes within PDWSA. Priority areas are assigned based on the current local planning scheme zoning, land tenure, the water source's strategic value and its' vulnerability to harm. Each priority area is managed using a specific risk-based strategy to provide for effective water resource protection.

P1, P2 and P3 areas are assigned via drinking water source protection plans or land use and water management strategies. This department develops these documents in consultation with other government agencies, landowners, industry and the community.

P1 areas are defined to ensure that there is *no degradation* of the water source induced by significant or high risk human activity. These areas are declared over land where the provision of a high quality drinking water source for public use is the prime beneficial land value. P1 areas typically cover land controlled by a state government agency. P1 areas are managed in accordance with the principle of *risk avoidance* and so most land development and human activity is normally opposed.

P2 areas are defined to ensure that there is *no increased risk of pollution* to the water source once a source protection plan has been published. These areas are declared over land where low intensity development (such as rural use) already exists. Protection of public water supply sources is a high priority in these areas. P2 areas are managed via the principle of *risk minimisation*, and so the intensity of land development is restricted (with management conditions) and activities with a low contamination risk are accepted.

P3 areas are defined where it is necessary to *manage the risk of pollution* to a water source. These areas are declared over land where public water supply sources must coexist with other land uses such as residential, commercial and/or light industrial development. Protection of P3 areas is achieved through pollution control measures defined via environmental guidance (such as these notes) or via site-specific development conditions that limit the contamination risk to water resources from the land use or activity. If a drinking water source becomes significantly contaminated, then water supplied from P3 sources may need to be treated more intensively or an alternative water source found.

Protection zones are also defined close to the point where drinking water is harvested or stored. These zones are known as *wellhead protection zones* (WHPZs) and *reservoir protection zones* (RPZs). Additional constraints provided under catchment protection statutes apply to activities within these zones to further safeguard an area closest to these vulnerable water sources.

WHPZs are assigned around drinking water production wells. Specific land use restrictions apply in these zones. Groundwater in WHPZs moves rapidly towards wells due to the extraction pump depressurising the aquifer. Any contamination leaching from the ground surface within WHPZs can rapidly migrate into scheme water supplies (before effective remedial action can occur). In sedimentary basins, WHPZs are usually circular, with a radius of 500 m in P1 areas and 300 m in P2 and P3 areas. These zones do not extend beyond PDWSA boundaries.

RPZs are defined over and around public water supply dams or pipe-head reservoirs. Statutory access and land use restrictions apply in RPZs. The aim is to restrict the likelihood of contaminants being deposited or washing into water sources following rainfall. RPZs within state-controlled land cover an area of up to two kilometres measured from the reservoir top water level and include the inundated area when the reservoir is full.

For additional explanatory information on PDWSAs, see our Water quality protection note (WQPN) no. 25: *Land use compatibility in public drinking water source areas* and WQPN no. 36: *Protecting public drinking water source areas*.

### *Buffers to water supply sources*

Native vegetation buffers should separate compatible land use areas from the full supply level of reservoirs, their primary feeder streams and production bores used as a source of drinking water. Advice is provided on suitable buffer forms and dimensions in our WQPN no. 6: *Vegetated buffers to sensitive water resources*.

### *Within clearing control catchments*

Specific controls on vegetation clearing for salinity management are provided under part IIA of the *Country Areas Water Supply Act 1947.* These controlled land areas apply within in the Wellington Dam, Harris River Dam, Mundaring Weir and Denmark River catchment areas and the Kent River and Warren River water reserves.

Details on clearing controls may be obtained from our local regional office. For offices locations see online information at <www.water.wa.gov.au>, select *Contact us*.

*Established activities within PDWSA*

Many land use activities were approved and established before publication of a source protection plan or strategy. We encourage the operators of all established land use activities to progressively improve their environmental management facilities and practices so the risk to water resources is minimised (mindful of practical and economic constraints).

*New or expanded activities in PDWSA*

Any development proposals that could affect a drinking water source should be referred to this department's local regional office with detailed supporting information for an assessment and written response.

The development proposal may be:

- approved (with or without conditions)
- delayed pending receipt of additional information before a decision is made; or
- opposed due to a statutory or policy conflict or inadequate protective measures provided to safeguard the water source.

To assist the assessment, operators should demonstrate that under all operating conditions the facilities and processes used on-site do not pose a significant water contamination risk.

## Note limitations

Many Western Australian aquifers, waterways and wetlands await detailed scientific evaluation, present data on their quality is sparse and their values remain unclassified. Unless demonstrated otherwise, any natural waters that are slightly disturbed by human activity are considered to have sensitive environmental values. Community support for these water values, the setting of practical management objectives, provision of sustainable protection services and effective implementation are vital to protecting or restoring water resources for both current needs and those of future generations.

This note provides a general guide on environmental issues, and offers solutions based on data searches, professional judgement and precedents. Recommendations made in this note do not override any statutory obligation or government policy statement. Alternative practical environmental solutions suited to local conditions may be considered.

This note's recommendations shall not be used as this department's policy position on a specific matter, unless confirmed in writing. In addition, regulatory agencies should not use this note's recommendations in place of site-specific development conditions based on a project's assessed environmental risks. Any regulatory conditions should consider local environmental values, the safeguards in place and take a precautionary approach.

Where a conflict arises between this note's recommendations and any activity that may affect a sensitive water resource, this note may be used to assist stakeholder negotiations. The negotiated outcome should not result in a greater water quality contamination risk than would apply if the recommended protection measures were used.

## Water quality protection note updates

This note will be updated as new information is received, industry/activity standards change and resources permit. The currently approved version is available online at

<www.water.wa.gov.au> select *publications > find a publication > series browse > water quality protection notes.*

## Appendix B: Statutory approvals relevant to this note

| What's regulated? | Western Australian statutes | Regulatory office |
|---|---|---|
| Aboriginal Heritage and Native Title Claims | *Native Title Act 1993* | Department of the Attorney General - Office of Native Title www.ont.dotag.wa.gov.au |
| | *Aboriginal Heritage Act 1972* | Department of Indigenous Affairs www.dia.wa.gov.au |
| Occupational health and safety | *Occupational Safety and Health Act 1984* | Department of Commerce www.commerce.wa.gov.au |
| Bushfire control on state controlled land | *Conservation and Land Management Act 1984* | Department of Environment and Conservation www.dec.wa.gov.au |
| Prescribed premises that could pollute | *Environmental Protection Act 1986,* Part V Environmental regulation | |
| Forest management and harvesting activities | Forest Management Regulations 1993 | |
| | | Forest Products Commission < www.fpc.wa.gov.au > |
| Transport, storage and handling of fuels, solvents, explosive and other dangerous goods | *Dangerous Goods Safety Act 2004*<br>Dangerous goods safety regulations 2007 | Department of Mines and Petroleum, Resources Safety Division<br>www.dmp.wa.gov.au |
| Taking of surface water, groundwater or waterway disturbance | *Rights in Water and Irrigation Act 1914* | Department of Water, regional office www.water.wa.gov.au |
| Discharge of waters to managed waterways | *Waterways Conservation Act 1976* | |
| Fertiliser use in PDWSAs<br>Chemical use and storage in PDWSAs<br>Pesticide use in PDWSAs | *Metropolitan Water Supply, Sewerage and Drainage Act 1909*<br>*Country Areas Water Supply Act 1947* | Department of Water, regional office www.water.wa.gov.au |
| Storage of hydrocarbons in PDWSAs | Metropolitan Water Supply, Sewerage and Drainage Act By-laws 1981 | |
| Clearing of native vegetation in the Mundaring, Wellington, Harris, Denmark, Warren or Kent catchments | Country Areas Water Supply Act By-laws 1957 | |
| Emergency response planning | *Fire and Emergency Services Authority of WA Act 1998* | Fire and Emergency Services Authority www.fesa.wa.gov.au |

| What's regulated? | Western Australian statutes | Regulatory office |
|---|---|---|
| Bushfire controls | *Bushfires Act 1954*<br>*Bushfires Amendment Act 1987* | Local government authority |
| Wetlands, drinking water catchments and estuaries | *Environmental Protection Act 1986*, Part III Environmental protection policies | Minister for the Environment advised by the Environmental Protection Authority<br>www.epa.wa.gov.au |
| Impact of significant development proposals on the values and ecology of land or natural waters | *Environmental Protection Act 1986*, Part IV Environmental impact assessment | |

Relevant statutes are available from the State law publisher at <www.slp.wa.gov.au>.

# Appendix C: Data needed to assess development approvals

The following checklists are provided to assist plantation owners or managers to develop plantation management plans, harvest management plans and drinking water quality management plans. Ticks have been used to note information that is required in each plan in order for the Department of Water to assess the proposal.

*Table 1 Assessment checklist for a plantation management plan*

| **Information needed** | **Plantation management plans** | | | |
|---|---|---|---|---|
| | **Plantation map** | **Establishment plan** | **Maintenance plan** | **Fire plan** |
| Land owner and plantation manager details | ✓ | | | |
| Relevant stakeholder contact details including emergency response | | ✓ | ✓ | ✓ |
| A map showing plantation categories and areas | ✓ | | | |
| A locality plan which includes access roads | ✓ | | | ✓ |
| **Infrastructure within the PDWSA** | | | | |
| Fences and gates (including security measures) | ✓ | | ✓ | ✓ |
| Utilities (including production bores used for town water supply) | ✓ | | | ✓ |
| Water points | ✓ | | | ✓ |
| Roads and tracks | ✓ | | ✓ | ✓ |
| Fire breaks and access | ✓ | ✓ | ✓ | ✓ |
| Bridges and creek crossings | ✓ | | | ✓ |

| Information needed | Plantation management plans | | | |
|---|---|---|---|---|
| | Plantation map | Establishment plan | Maintenance plan | Fire plan |
| Services, power lines and other reticulated services | | ✓ | ✓ | ✓ |
| **Natural features** | | | | |
| Waterways (including feeder streams to reservoirs and waterways within water reserves) | ✓ | ✓ | ✓ | ✓ |
| Areas of native vegetation | ✓ | ✓ | ✓ | ✓ |
| Vegetation buffer areas to waterways | ✓ | ✓ | ✓ | ✓ |
| Other significant features (such as reservoir foreshore areas, wetlands) | ✓ | | ✓ | ✓ |
| **Water resource management areas** | | | | |
| Priority areas (P1, P2 or P3) | ✓ | ✓ | ✓ | |
| Protection zones (RPZ or WHPZ) | ✓ | ✓ | ✓ | |
| Drinking water source location (reservoir or recharge area) | ✓ | ✓ | ✓ | ✓ |
| **Plantation management** | | | | |
| Harvest residue management prior and post planting | | ✓ | ✓ | |
| Areas to be planted and compartment sizes | | ✓ | | |
| Location of plantation rows and rip lines, in relation to contours and natural drainage channels | | ✓ | | |

| Information needed | Plantation management plans | | | |
|---|---|---|---|---|
| | Plantation map | Establishment plan | Maintenance plan | Fire plan |
| Drainage areas and control measures | | ✓ | ✓ | |
| Plantation species type(s) | | ✓ | | ✓ |
| Description of site and soil preparation methods. | | ✓ | | |
| Planting prescription | | ✓ | | |
| Pest and weed control methods and regime. | | ✓ | ✓ | |
| Fertilising prescription or nutrient and irrigation management plan | | ✓ | ✓ | |
| Pruning and thinning regimes | | | ✓ | |
| **Fire/incident management and response** | | | | |
| Locality plans showing access roads, firebreaks, water points | | | | ✓ |
| Methods of access to roads and firebreak maintenance | | | | ✓ |
| Fire fighting equipment register for the locality and details of cooperative arrangements | | | | ✓ |
| Direction indicators to water points, road signs and other features | | | | ✓ |
| A fuel reduction program, if applicable | | | ✓ | ✓ |

*Table 2 Checklist for assessing plantation harvest management plans or drinking water quality management plans (DWQMP)*

| **Information needed** | **Harvest management plan (<10ha)** | **DWQMP (>10ha)** |
|---|---|---|
| Harvest manager details | ✓ | ✓ |
| Plantation owner details | ✓ | ✓ |
| Landowner details | ✓ | ✓ |
| **Map of the harvest area** | | |
| Map of the harvest area in relation to waterways and reservoirs | ✓ | ✓ |
| Map of the harvest area in relation to vegetation buffers | ✓ | ✓ |
| **Location of access track and roads to be used and location of signage** | | |
| Drainage controls | ✓ | ✓ |
| Haulage routes, plantation roads and extraction tracks | | ✓ |
| **Proposed harvesting methods** | | |
| Pre harvest notification to Department of Water and water service provider | | ✓ |
| Updated harvest plans and progress plans (as specified in the DWQMP) | | ✓ |
| Winter inspection | | ✓ |
| Harvest residue management | ✓ | ✓ |
| Landing and log storage areas | | ✓ |
| Protection measures for vegetated buffers | ✓ | ✓ |
| **Establishment methods for second rotation** | | |

| Information needed | Harvest management plan (<10ha) | DWQMP (>10ha) |
|---|---|---|
| Proposed dates for replanting | ✓ | ✓ |
| Attached establishment plan (if applicable) | ✓ | ✓ |
| **Fire protection preparedness, response and restrictions** | | |
| Attached fire management plan | ✓ | ✓ |
| **Wet-weather restrictions to minimise soil disturbance and turbidity contamination** | | |
| Drainage measures | ✓ | ✓ |
| Heavy machinery restriction during high rainfall events | ✓ | ✓ |
| Onsite inspections with Department of Water and water service provider | | ✓ |
| **Safeguards to protect significant features** | | |
| Water source protection specific management methods | ✓ | ✓ |
| Incidents that may cause contamination to the water resource asset | ✓ | ✓ |
| Protection methods for vegetation buffers during harvest operations | ✓ | ✓ |
| **Minimum safety requirements** | | |
| **Hygiene measures** | | |
| Disease risk area control | ✓ | ✓ |
| Management of microbiological risks | | ✓ |

# References and further reading


1 Australian Government National water quality management strategy papers, available online at < www.environment.gov.au > select *water* > *water policy and programs* > *water quality:*

a Paper 2 *Policies and principles*, 1994

b Paper 3 *Implementation guidelines*, 1998

c Paper 4 *Australian and New Zealand guidelines for fresh and marine water quality,* 2000

d Paper 6 *Australian drinking water guidelines,* 2011

e Paper 7 *Australian guidelines for water quality monitoring and reporting,* 2000

f Paper 9 *Rural land uses and water quality - a community resource*, 2000

To obtain printed copies of the papers, see internet site < *www.awa.asn.au* >, request them by email at < *bookshop@awa.asn.au* > or obtain them from a library.

2 Department of Environment and Conservation (WA) 2009, Sustainable forest management series: *Soil and water conservation guidelines*, available online at <www.dec.wa.gov.au>.

3 Department of Health (WA) publication available online at < www.health.wa.gov.au > Health hazards in the environment > Chemicals and pesticides

a Public service circular no. 88 (PSC 88) *Use of herbicides in water catchment area*s

b *A guide to the use of pesticides in Western Australia.*

4 Department of Mines and Petroleum - dangerous goods codes, guidelines and licenses. For online publications see < www.dmp.wa.gov.au > select *resources safety* > *dangerous goods* > *storage and handling.*

5 Department of Water publications available online at < www.water.wa.gov.au >

a Water resource management policies

- 2012, Operational policy: *Identifying and establishing waterways foreshore areas*
- 2000, State-wide policy no. 2: *Pesticide use in public drinking water source areas,* Water and Rivers Commission.

b 2009 *Plantation forestry and water management guideline*, select *managing our water* > *plantations* > *plantations and water management guideline.*

c Water quality protection notes (WQPN), select *publications* > *find a publication* > *series browse* > *water quality protection notes*

- WQPN 6 *Vegetated buffers to sensitive water resources*
- WQPN 22 *Irrigation with nutrient-rich wastewater*
- WQPN 25 *Land use compatibility in public drinking water source areas*
- WQPN 33 *Nutrient and irrigation management plans*
- WQPN 65 *Toxic and hazardous substances - storage and use.*

d Drinking water source protection plans, select *publications* > *find a publication* > *series browse* > *water resource protection plans*

e Waterways water notes (WN), select *publications* > *find a publication* > *series browse* >*water notes*

- WN 10: *Protecting riparian vegetation*
- WN 11: *Identifying the riparian zone*
- WN 23: *Determining foreshore reserves.*

f Stormwater publication available online at < www.water.wa.gov.au > select *publications* > *find a publication* > *series browse* > *stormwater management manual.*

Stormwater management manual for Western Australia.

6 Environmental Protection Authority (WA) publications available online at < www.epa.wa.gov.au > select *guidance statements*

a Guidance statement no. 3: *Industrial-residential buffer guidelines*

b Guidance statement no. 33: *Environmental guidance for planning and development.*

7 Engineers Australia publication available for purchase at < www.engineersmedia.com.au > search *EA books*

*Australian rainfall and run-off* (current edition).

8 Forest Industries Federation (WA) Inc. publications

a *Code of practice for timber plantations in Western Australia* 2006

b *Road haulage code of conduct 2005.*

9 Forest Products Commission (WA) publication

*Contractors timber harvesting manual – plantations* 2005.

10 The Institute of Foresters (IFA) of Australia, IFA policy statements, available online at < www.forestry.org.au> select *forestry* > *IFA policy statements*

a Statement 2.5: *Use of chemicals in plantation forestry*

b Statement 2.6: *Forest management planning*

c Statement 2.8: *Forest regulation and codes of practice*

d Statement 5.2: *Plantation forests and water.*

11 Natural Resource Management Ministerial Council (Australia) publication, available online at < www.iah.org.au > search *publications*

*Minimum construction requirements for water bores in Australia*, 2003.

12 Smethurst PJ, Nambiar S, Raison J, Moggridge B - National research flagships – sustainable agriculture - CSIRO August 2011, prepared for the Australian Department of Agriculture, Fisheries and Forestry and available online at www.csiro.au

*Assessment of code of practice for plantation forestry: Western Australia.*

13 Standards Australia publication, available for purchase at < www.saiglobal.com > select publications

Australian Standard 5667 *Water quality – sampling.*

14 Water and Rivers Commission (WA) publications, online at < www.water.wa.gov.au > select *Managing water> Rivers and estuaries> Protecting > Foreshore policies*

a Foreshore policy no. 1*: Determining the foreshore area 2002*

b River restoration report 16: *Determining foreshore reserves, A guide to the nature, protection, rehabilitation and long-term management of waterways in Western Australia 2001 (the River Restoration Manual).*

15 Western Australian Planning Commission policy 4.1, available online at < www.planning.wa.gov.au > select *plans and policies > state planning policies*

*State industrial buffer policy, draft 2009*.

## Disclaimer

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## Feedback

We welcome your thoughts on this note. Feedback will help us prepare future versions. To comment on this note or seek any clarification, please contact our water source protection planning branch (details below), citing the note topic and version.

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